The Far Eastern Review

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A Monthly Review of Far Eastern Trade, Finance and Engineering, Dedicated to the Industrial Development and Advancement of Trade in Far Eastern Countries.

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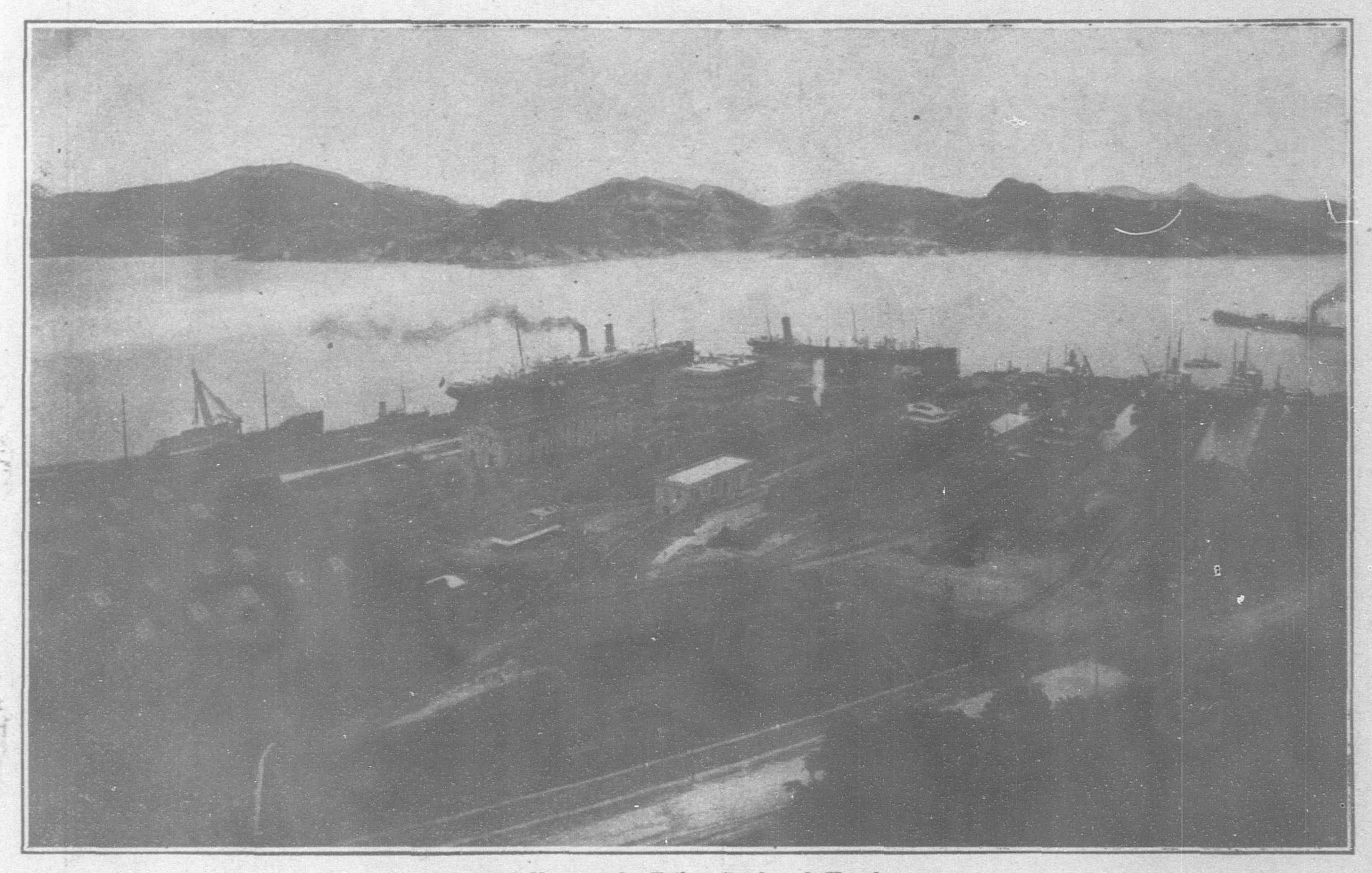
FAR EASTERN SHIPBUILDING

I. - HONGKONG

East, because every ship which comes into the China Sea passes through its magnificent harbor. It was one of the early governors of the Colony who told the local merchants that they could only regard the place as a sort of "bonded warehouse" where they might deposit their goods. While industries have and still are springing up, and the industrial future of Hongkong is very bright,

some thousands of natives and a large number of Europeans. Ocean-going steamers have been and are still being built there, engines and hulls, and there is also a good deal of ship repairing for lines travelling all over the Far East.

In 1856 the dock owned by Mr. Couper (formerly of the P. & O. service) at Whampoa was more or less destroyed and Couper wes captured and disappeared. His son, who was indemnified to the amount of \$120,000, then rebuilt the dock and



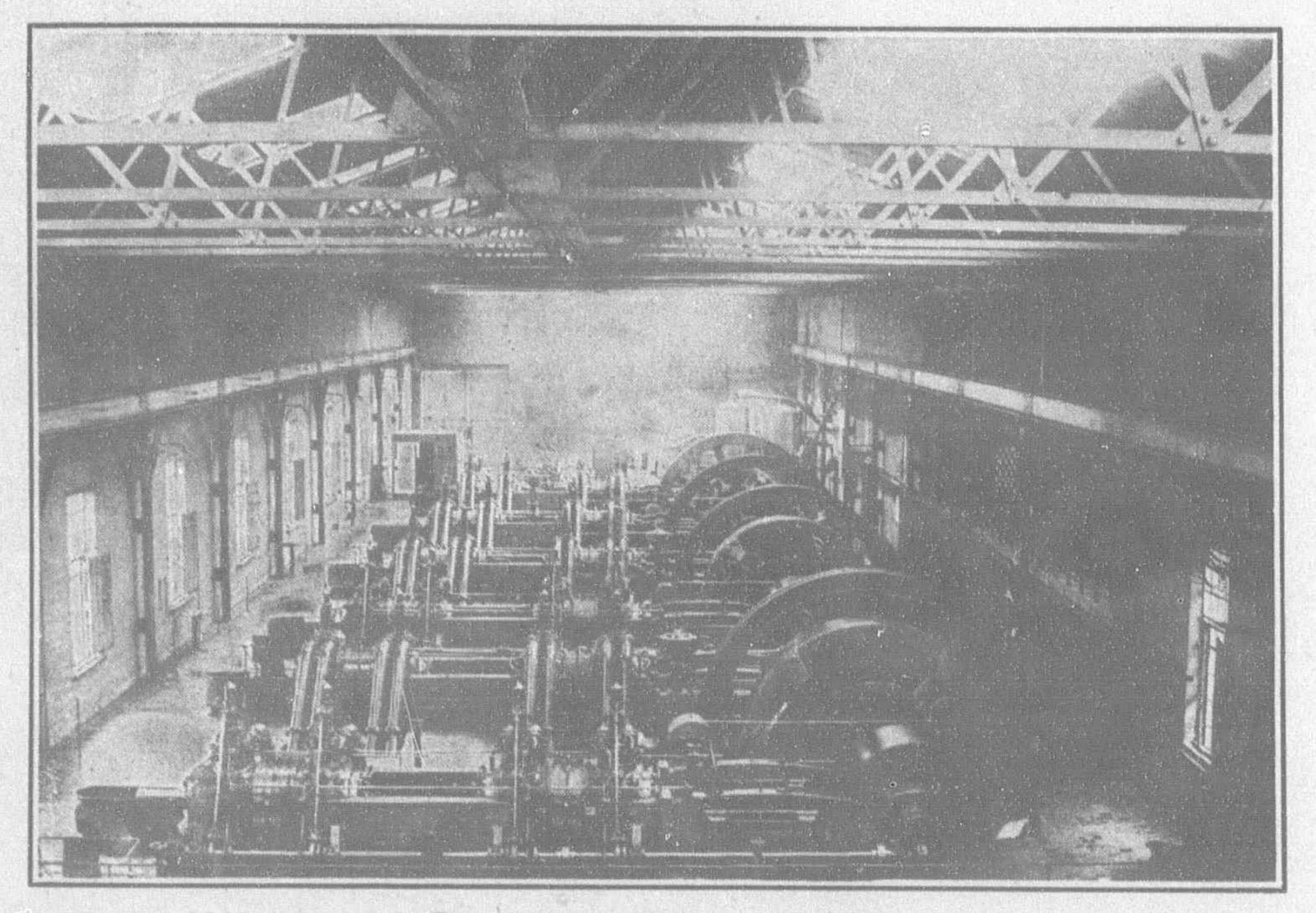
General View of the Taikoo Dockyard, Hongkong

yet the central fact of the local world of commerce, the central fact of everything in the Colony is shipping, and with this shipbuilding. Shipping and shipbuilding constitute the life blood of of the Colony, as was fully set out in The Far Eastern Review, "Ports of the Orient Number," February, 1919.

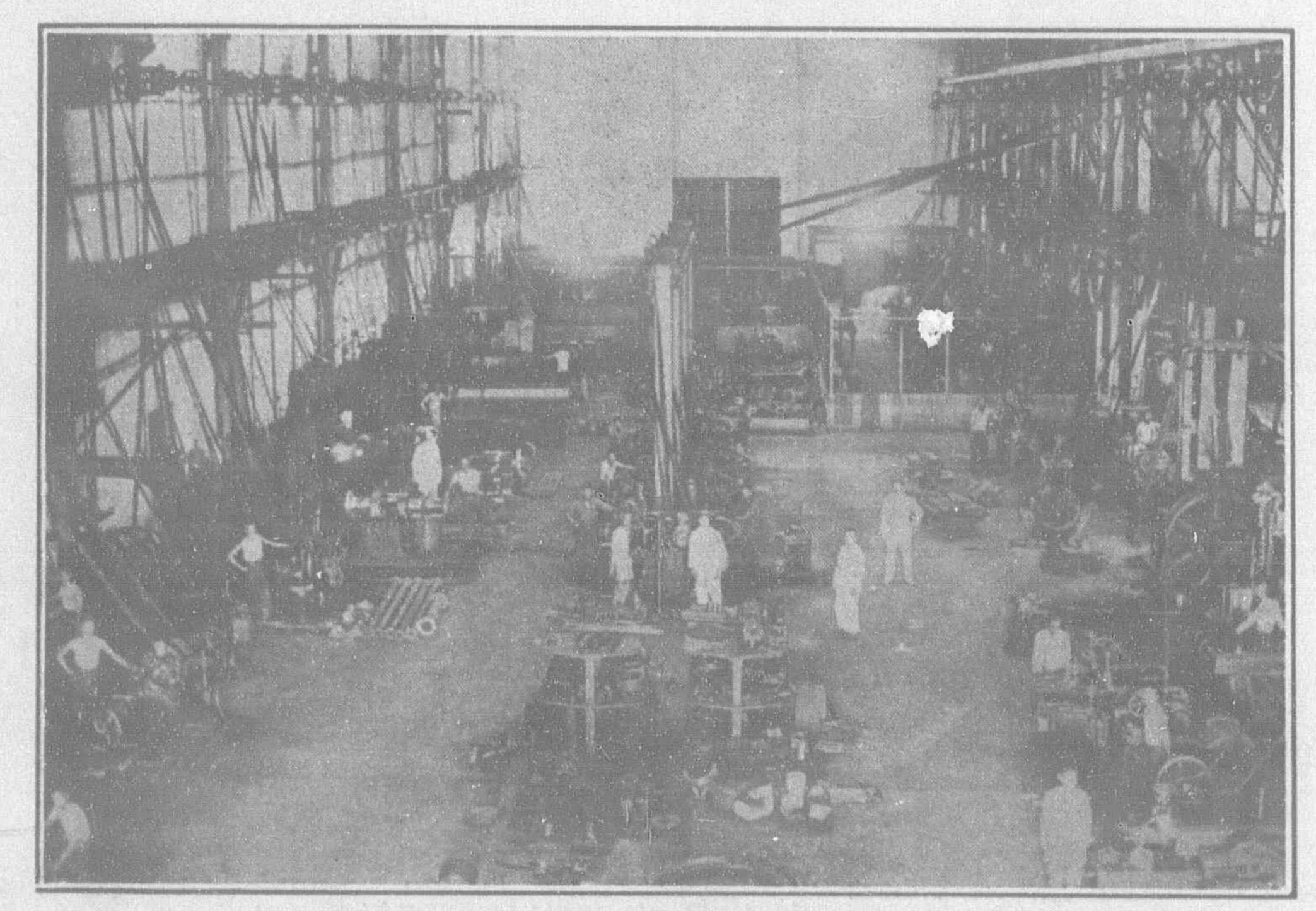
The year 1857 marks the commencement of what is to-day Hongkong's greatest industry—ship-repairing and shipbuilding—for in that year the Colony's first dock was established at Aberdeen by Mr. Douglas Lapraik and Captain J. Lamont. To-day the three large dockyards—one at Kowloon and two on the island—employ

eventually sold it to what has since become the Hongkong and Whampao Dock Company. This Company was established in 1863. A few years later it absorbed the dockyard enterprise at Aberdeen and has been steadily growing ever since. The original founders were Mr. James Whittall of Messrs. Jardine, Matheson & Co.; Mr. (now Sir) Thomas Sutherland, whose name is well known to this generation on account of its long association with the P. & O. Co., from the chairmanship of which he retired some time ago; and Mr. Douglas Lapraik. The Company was formed with a capital of \$240,000. This has been increased until it now stands at \$3,000,000.

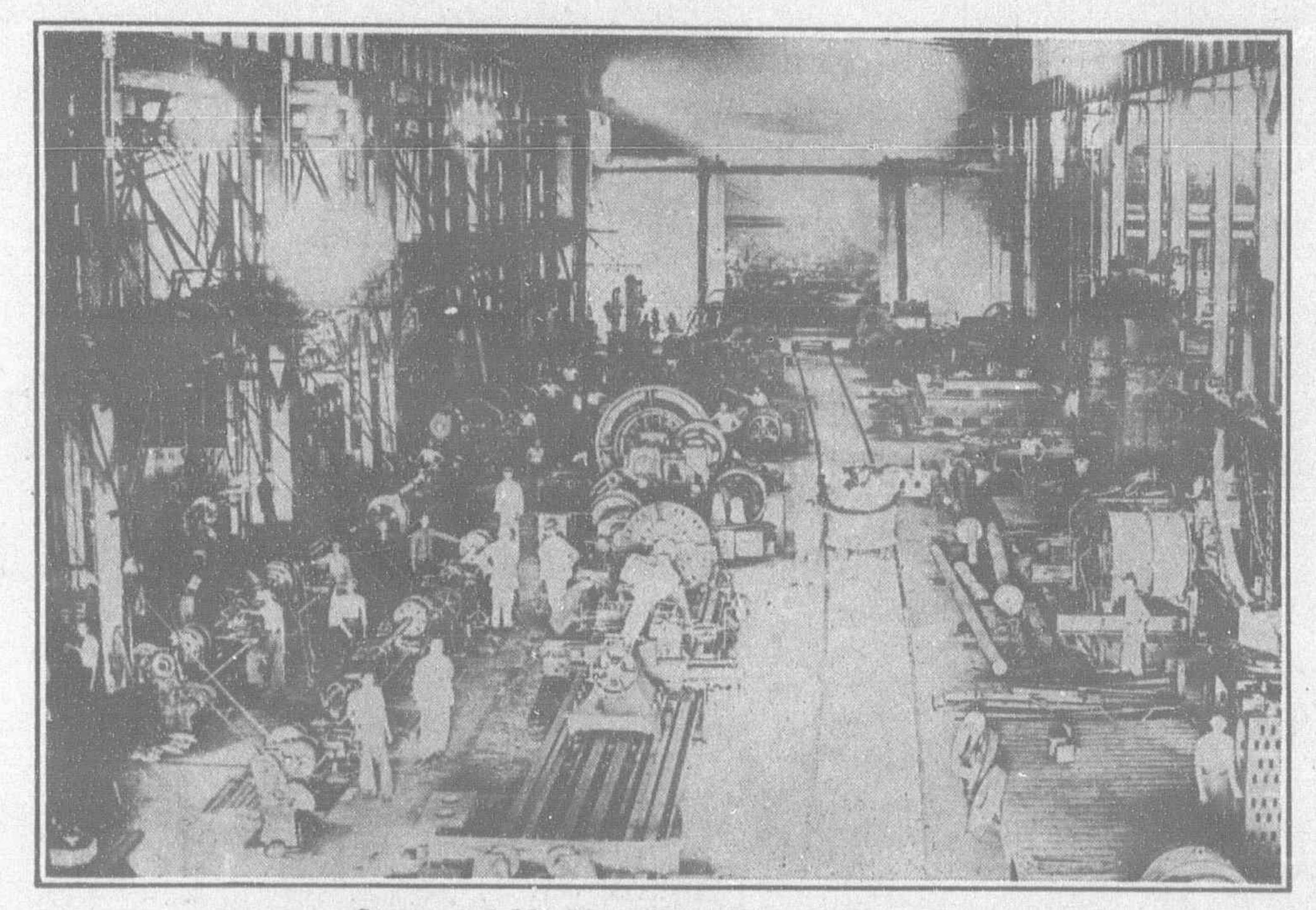
TAIKOO DOCKYARD & ENGINEERING CO. OF HONGKONG



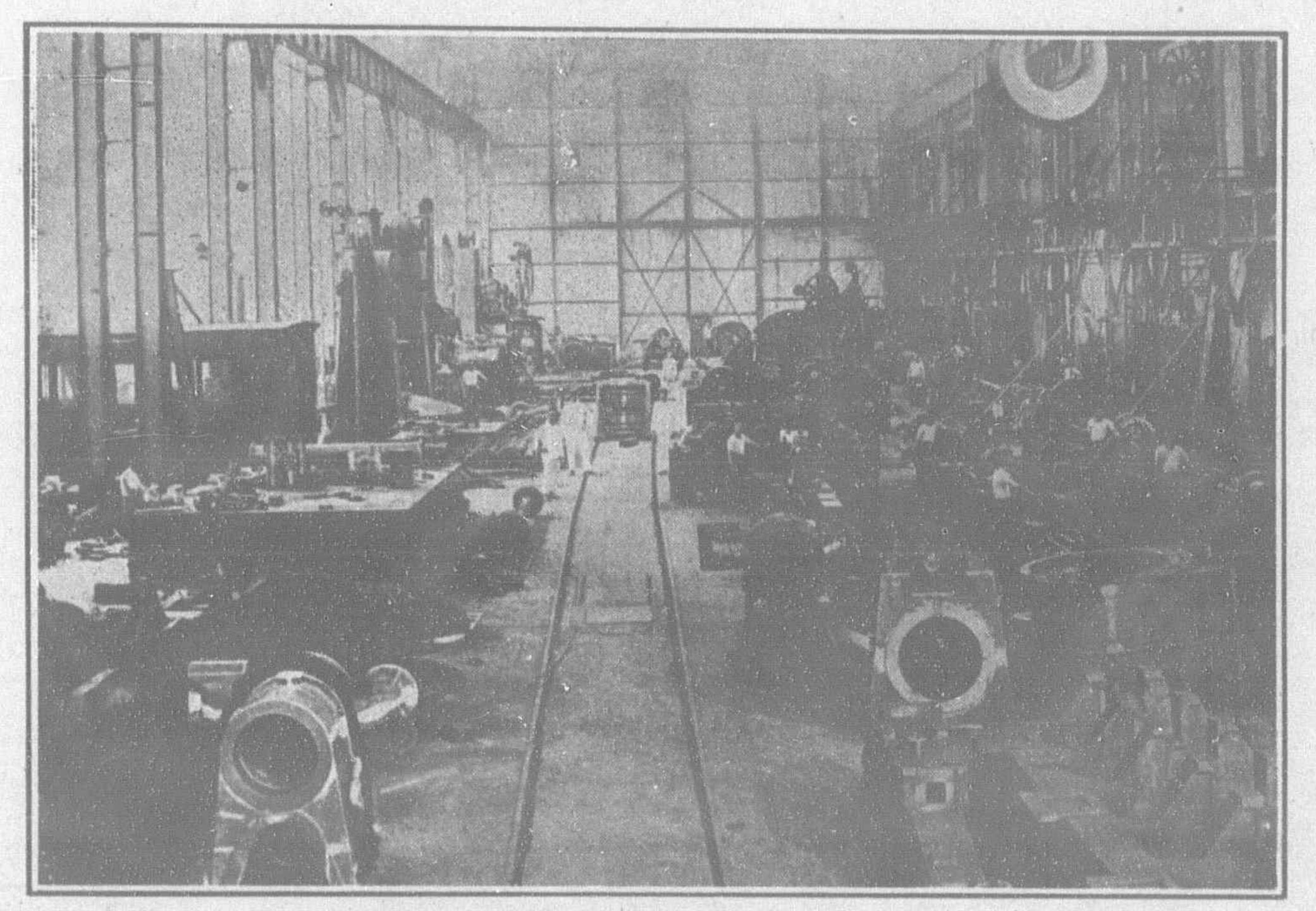
Power House, Taikoo Dockyard



Section of Machine Shop, Taikoo Dockyard



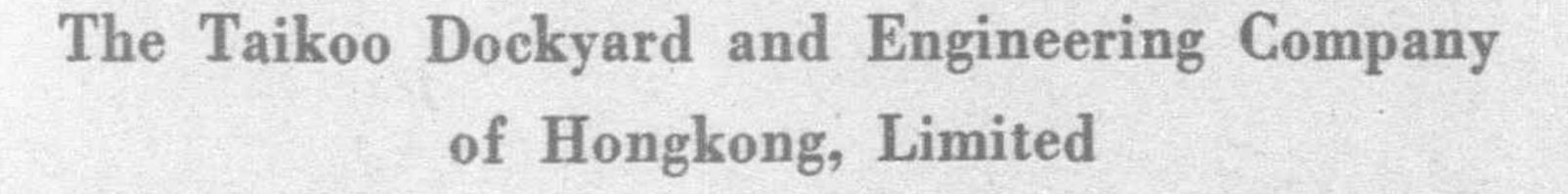
Section of Machine Shop, Taikoo Dockyard



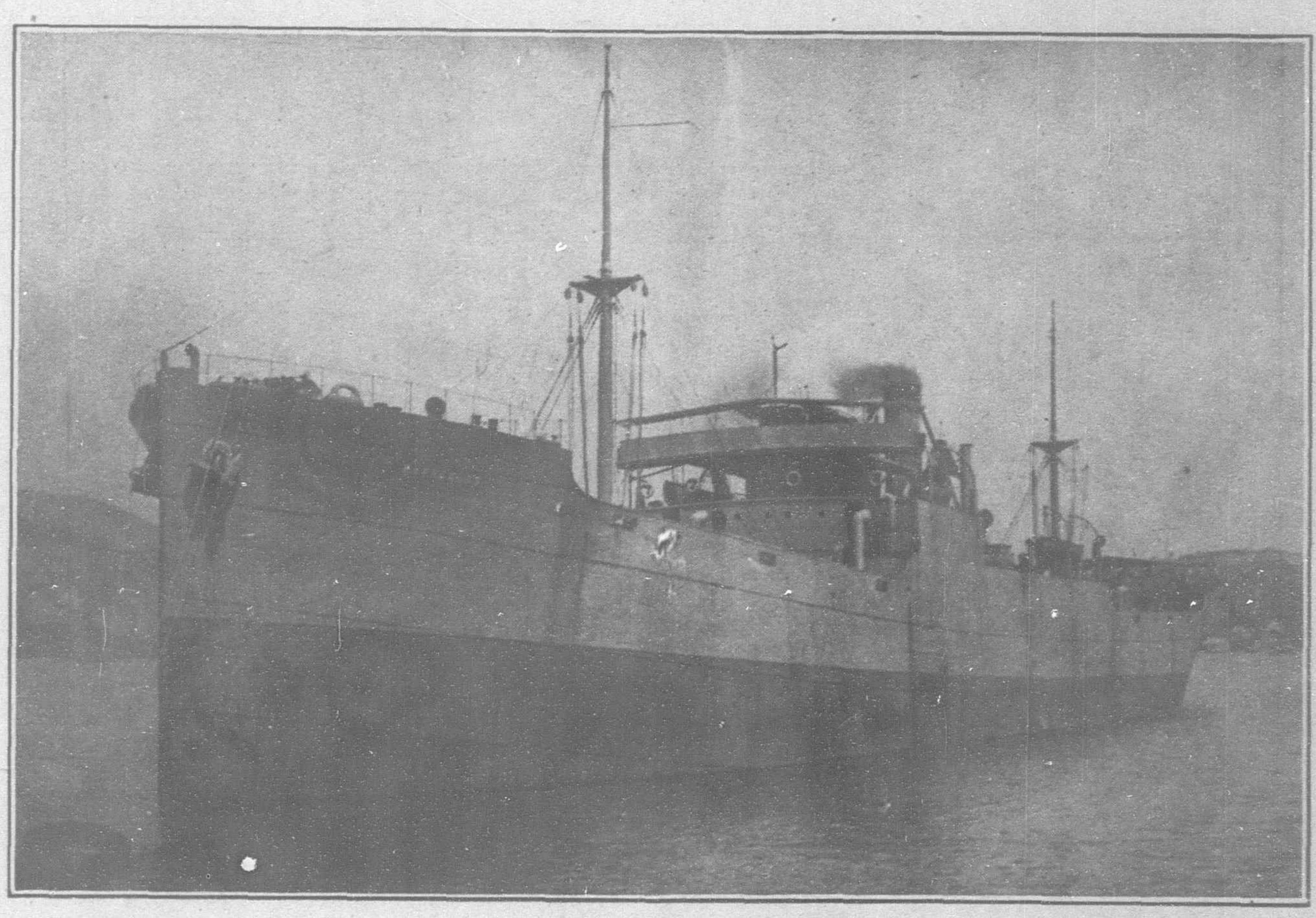
Section of Machine Shop, Taikoo Dockyard

In the early days the shipyard at Whampoa was a most important establishment. From 1866-69 all the large ships of the English and French mail companies were docked there, but, finally, the shipyard was sold to the Chinese and European ships where henceforth excluded. In 1875 the shares of the company stood at 60 per cent. discount and the dividends were most unsatisfactory. This position of the company was attributed in a large measure to the competition of the Cosmopolitan Dock and of a rival establishment owned by Captain Sands. In 1879 and 1880 these enterprises were absorbed and the position of the company improved considerably. In 1880, also,

the Admiralty, becoming anxious about the docking facilities of their warships on the China Station, gave the company a subsidy of £25,000 toward the cost of building a large new dock, on the condition that the warships should have the right of priority of entrance for a period of twenty years. The dock was completed in 1888 and the Admiralty privilege ended in 1908 in which year the Naval Dockyard and the Taikoo Dockyard came simultaneously into existence.



This Company's establishment, covering an area of 53 acres, is situated on the Island of Hongkong, just inside the Lyemun Pass—the northern and deeper entrance to the harbor—the

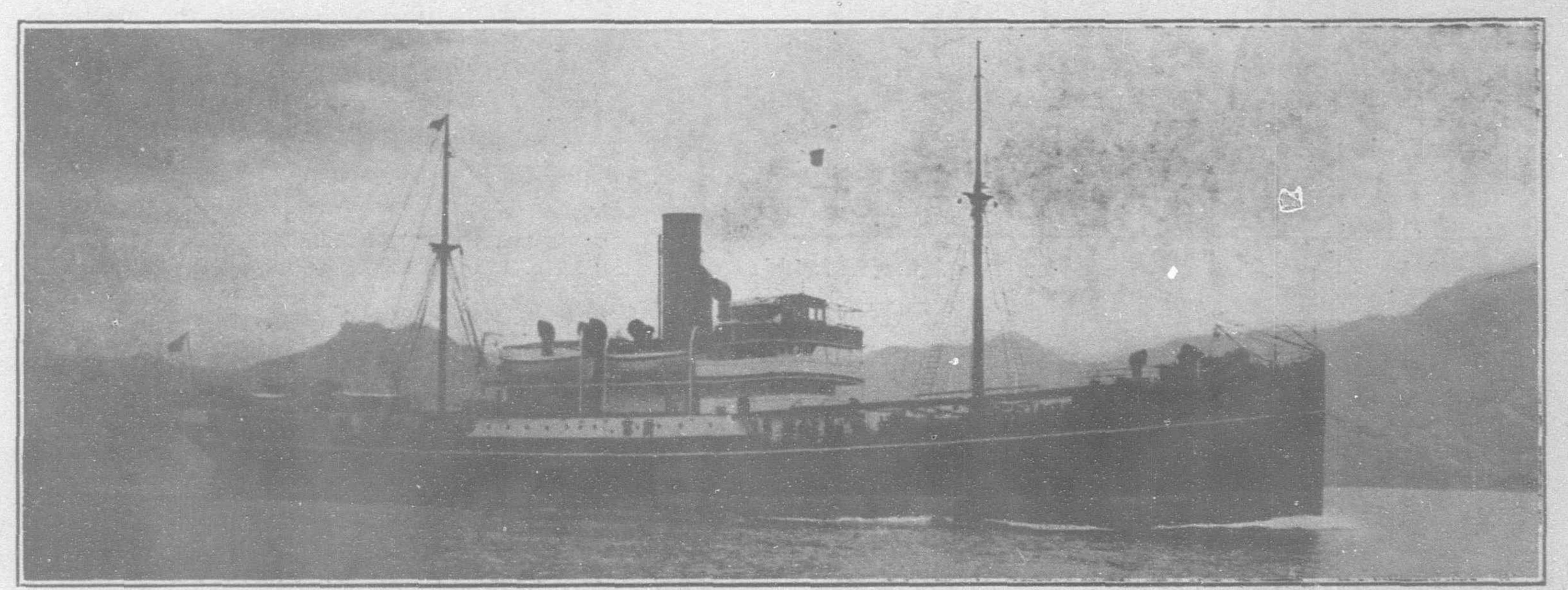


S.S. "Evangelos," 400-ft. by 52-ft. by 31-ft.

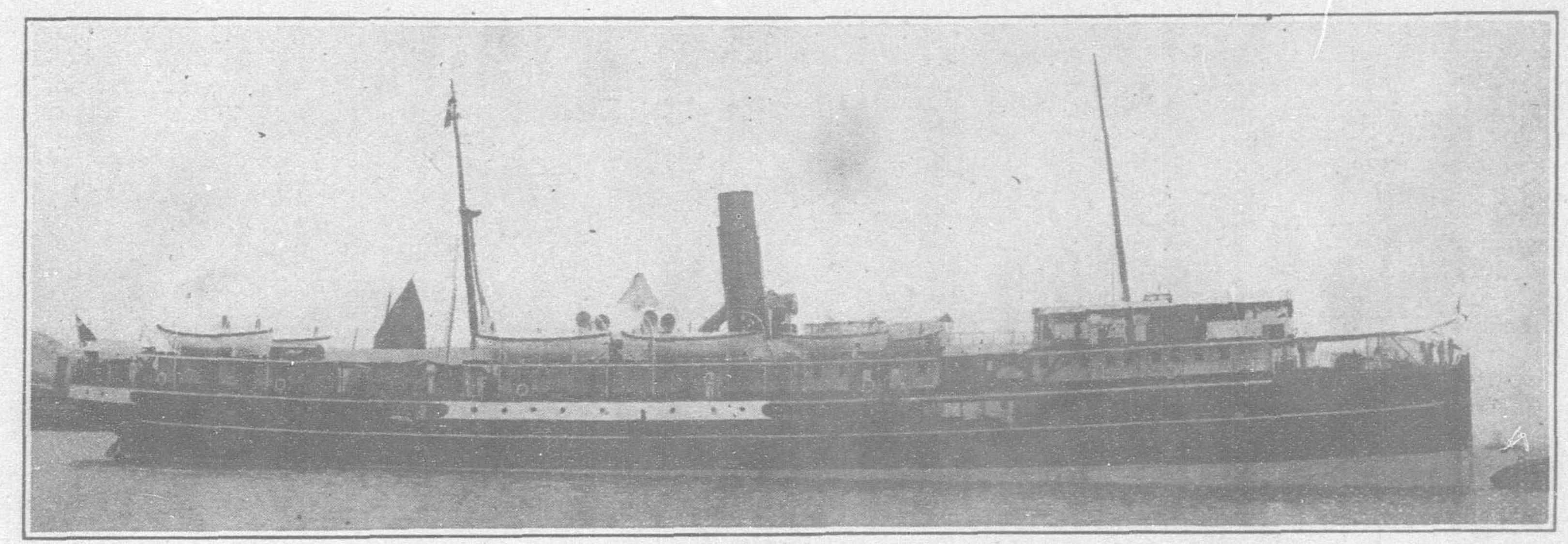
position being convenient to the City of Victoria, between which city and the dockyard the Company runs a ferry launch for the convenience of clients, the journey occupying 20 minutes. There is also an efficient service of electric cars from the city to the main entrance to the dockyard, this route taking half-an-hour. The works have been planned and equipped throughout with all the requirements necessary for the most modern and rapid ship and marine engine construction and repairs, and for overhauling all types of vessels, including warships, both in dry dock and on slipways. All classes of constructional and general engineering work are also undertaken.

The rapid handling of repairs has been made a special feature, and the dockyard is capable of executing such on the largest sized vessels with the utmost despatch.

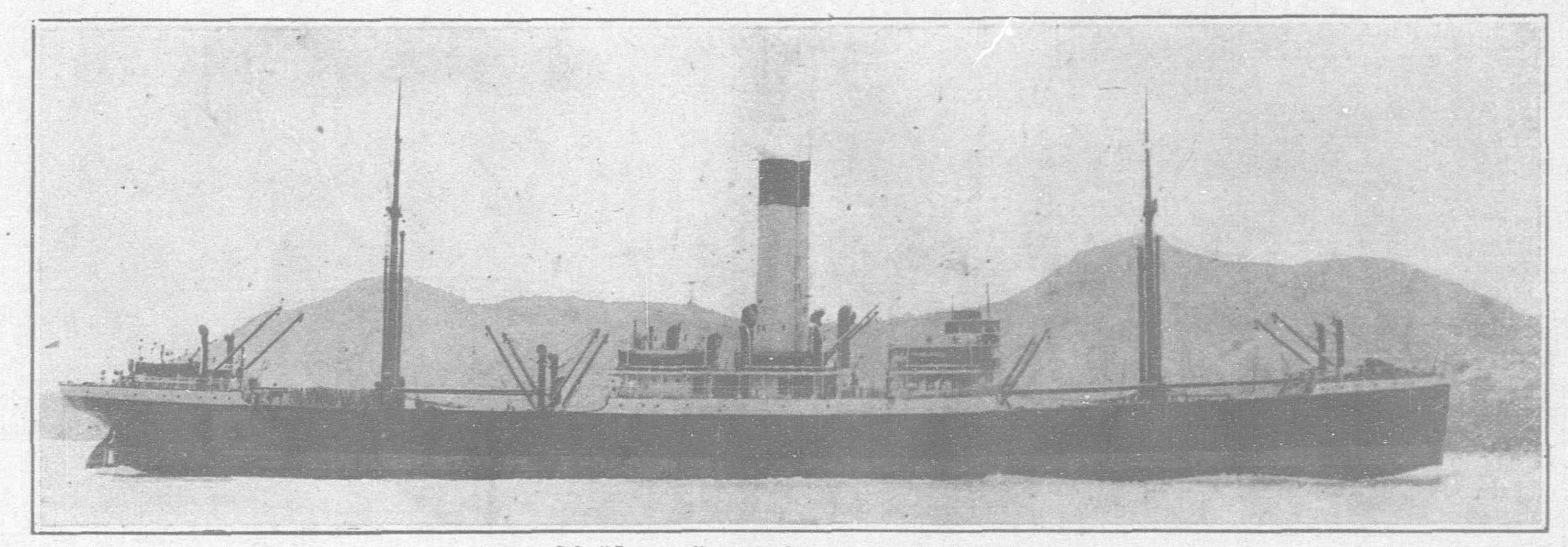
The work is carried on under the supervision of a large staff of Europeans.



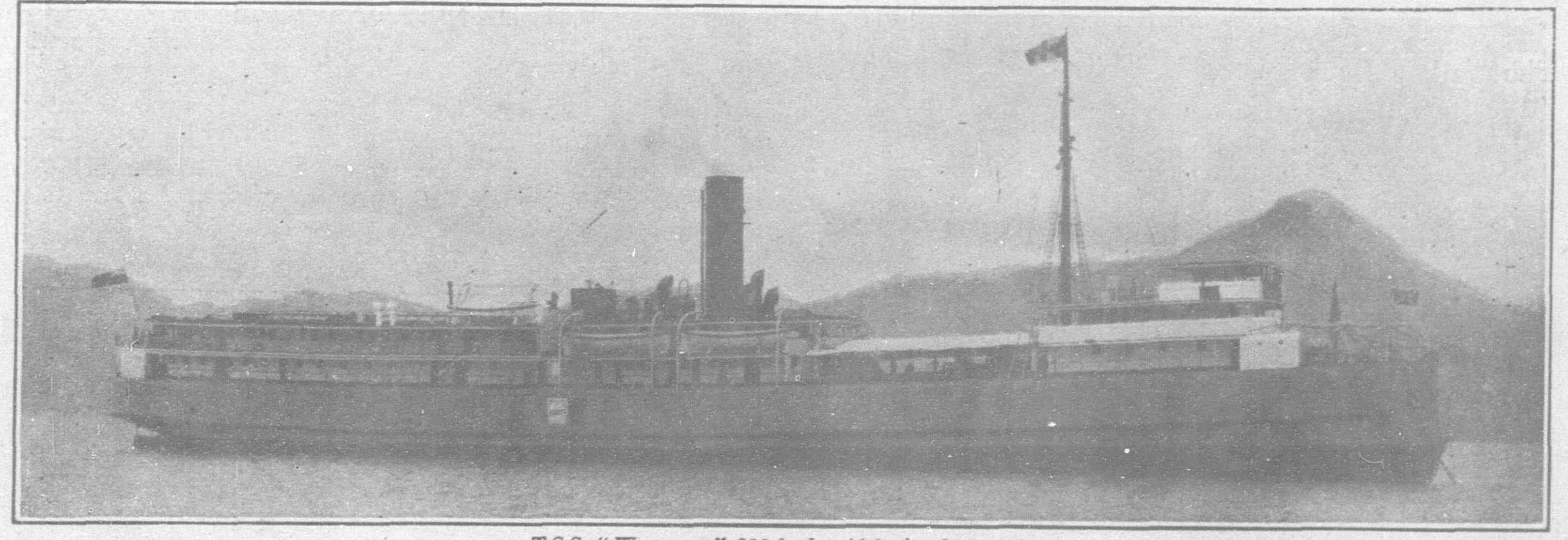
S.S. "Sunning," 310-ft. by 41-ft. by 24-ft. 9-in.



S.S. "Tungchow," 280-ft. by 40-ft. by 19-ft.



S.S. "Laertes," 422-ft. by 52-ft. by 32-ft. 9-in.



T.S.S. "Woosung," 320-ft. by 46-ft. by 14-ft. 8-in.

Dry Dock

The granite dry dock, constructed to British Admiralty requirements, is most conveniently placed for the full and free manœuvring of ships prior to docking, being well clear of any congestion of shipping in the harbor, and with an entrance free from all strong currents.

Its dimensions are:—

787-ft. 0-in. Extreme Length 88-ft. 0-top

88-ft. 0-in. Width of Entrance at top.

750-ft. 0-in. on the Blocks

120-ft. 0-in. Width at Coping

77-ft. 6-in. Width at Bottom

81-ft. 10-in. Width of Entrance at bottom.

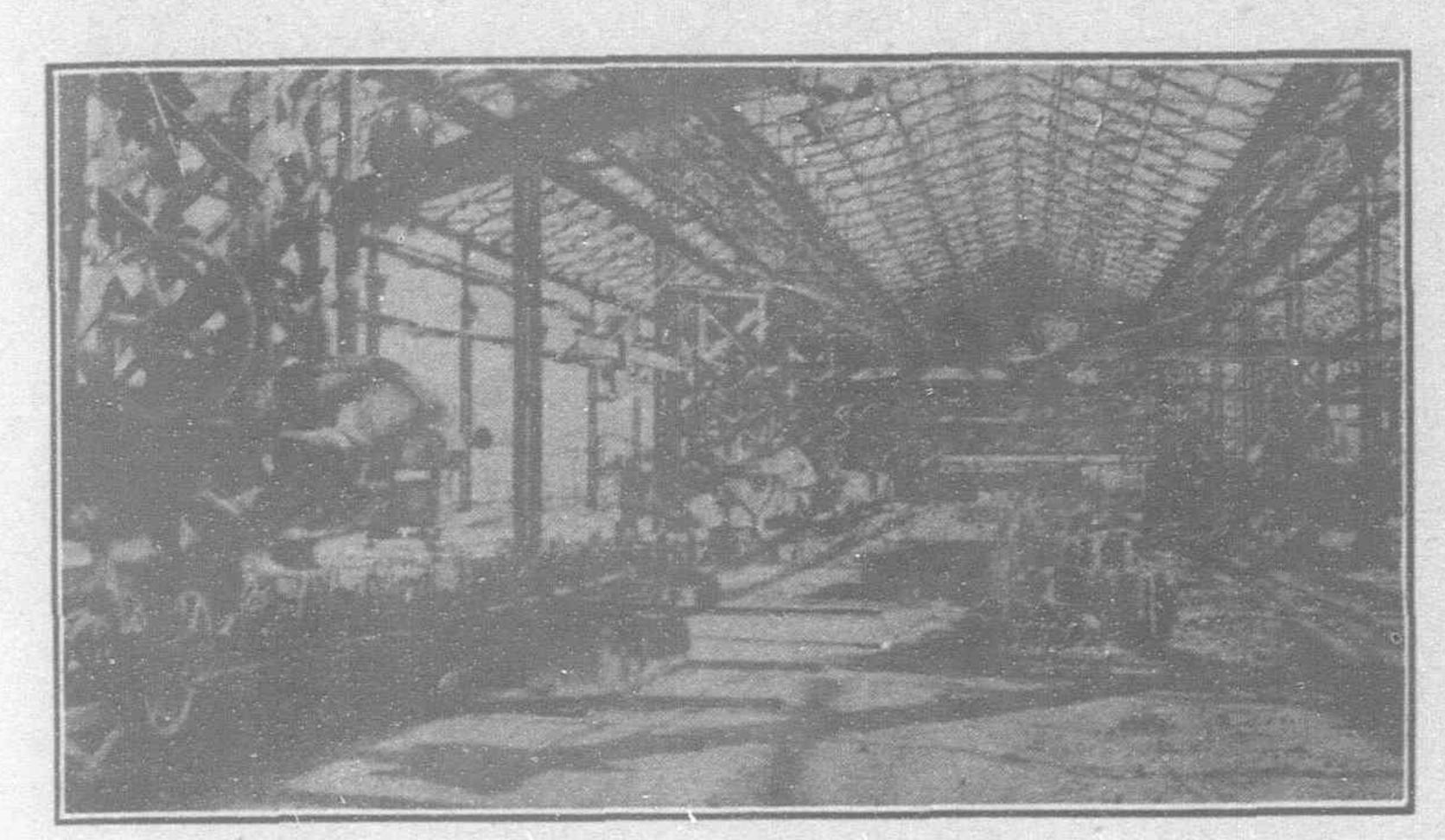
34-ft. 6-in. Depth of Water over centre of Sill at H. W. O. S. T.

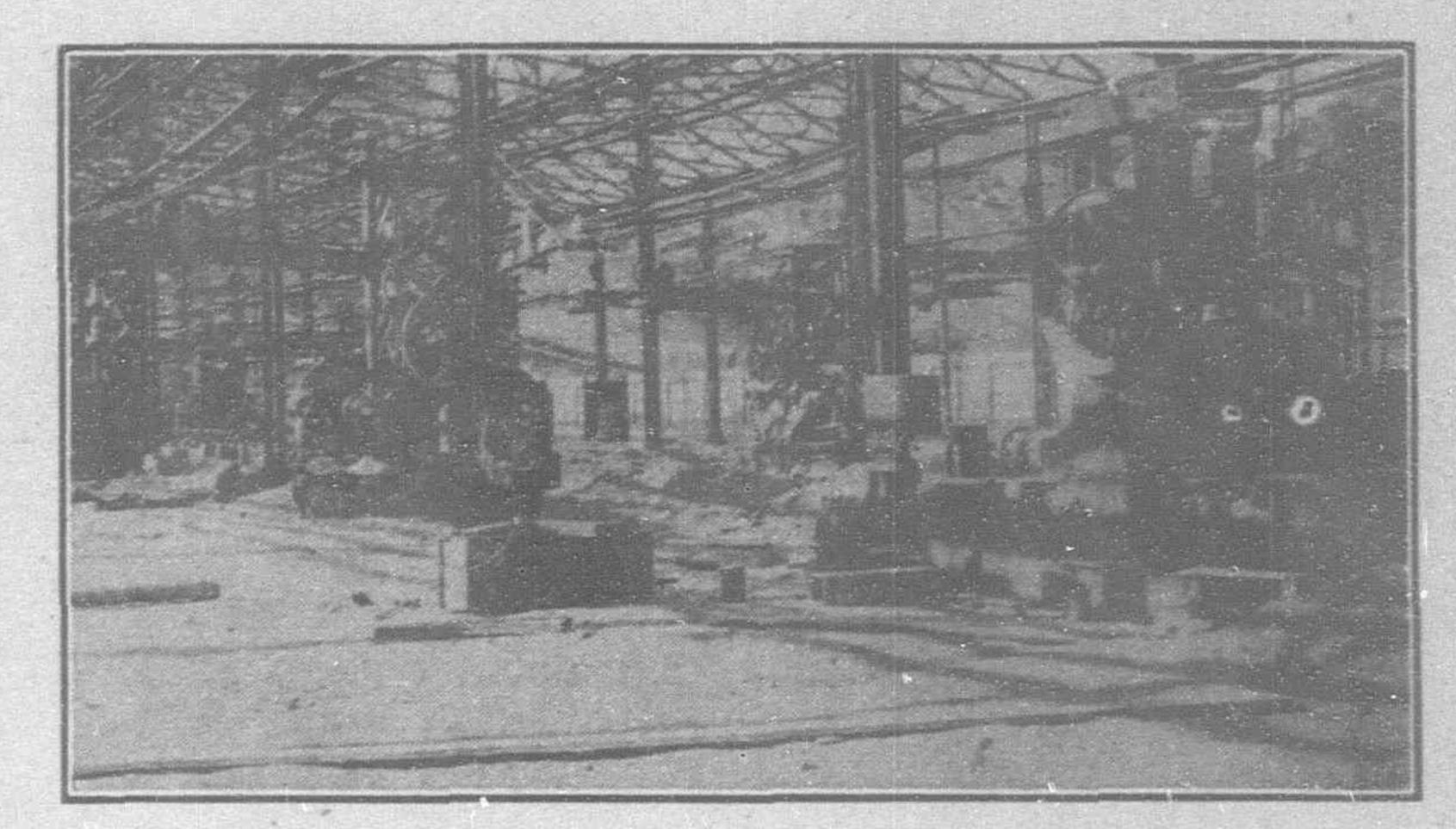
31-ft. 0-in. Depth of Water over sides of Sill at H. W. O. S. T.

The centre of the sill is 4-ft. 0-in. above the bottom of the dock.

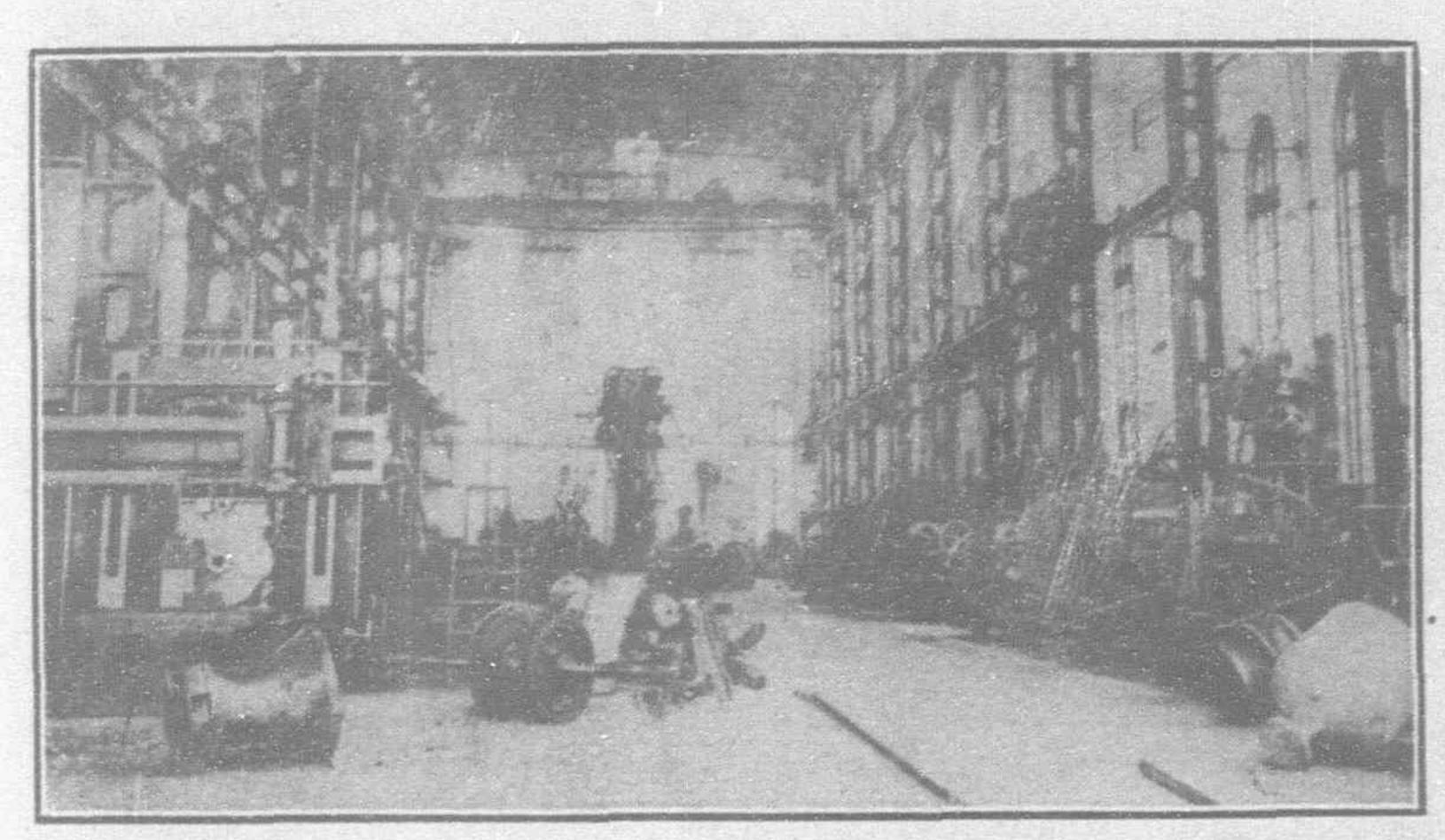
The caisson is of the box sliding type, weighs 400 tons, is

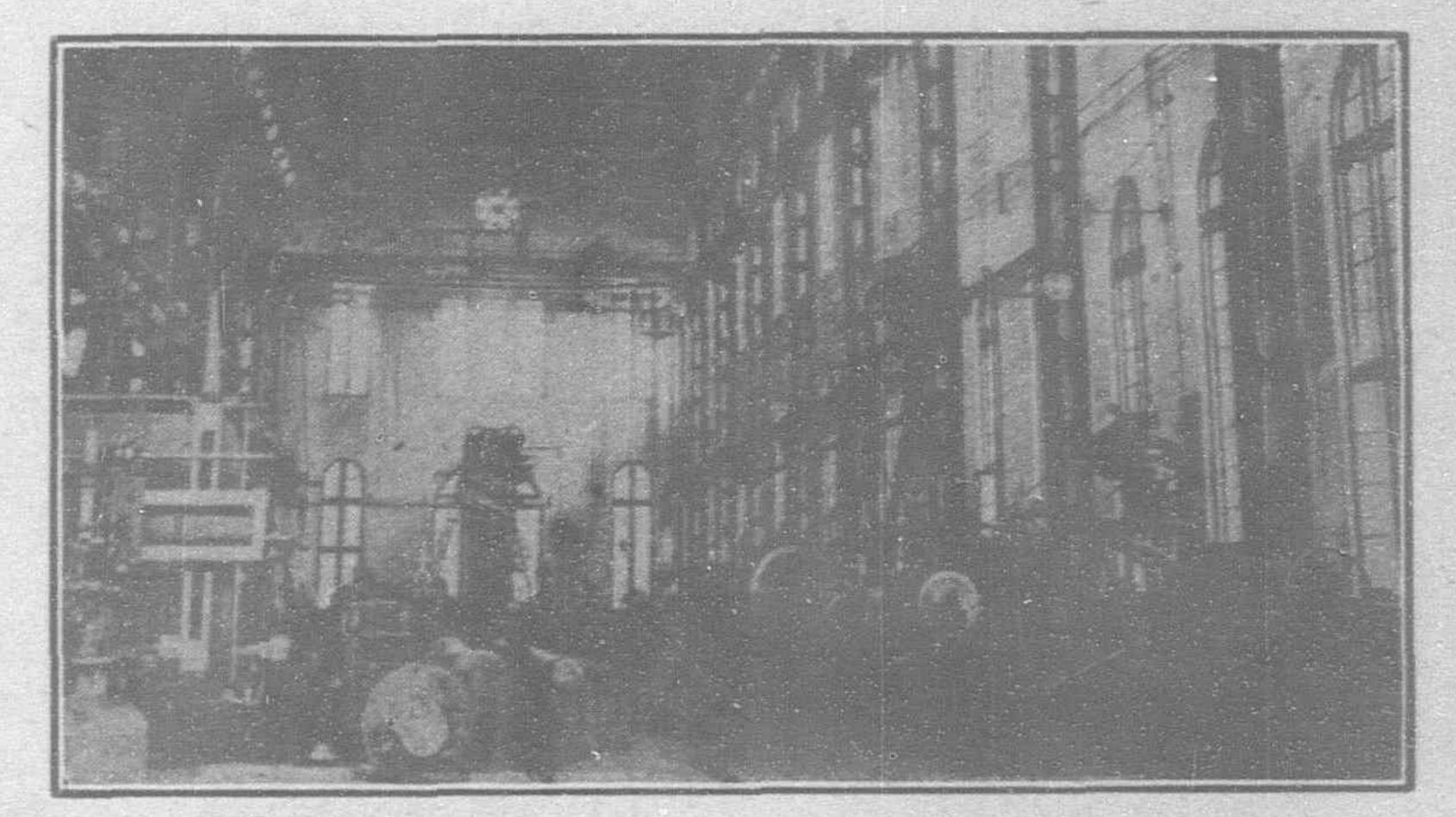
THE HONGKONG AND WHAMPOA DOCK CO., LTD.



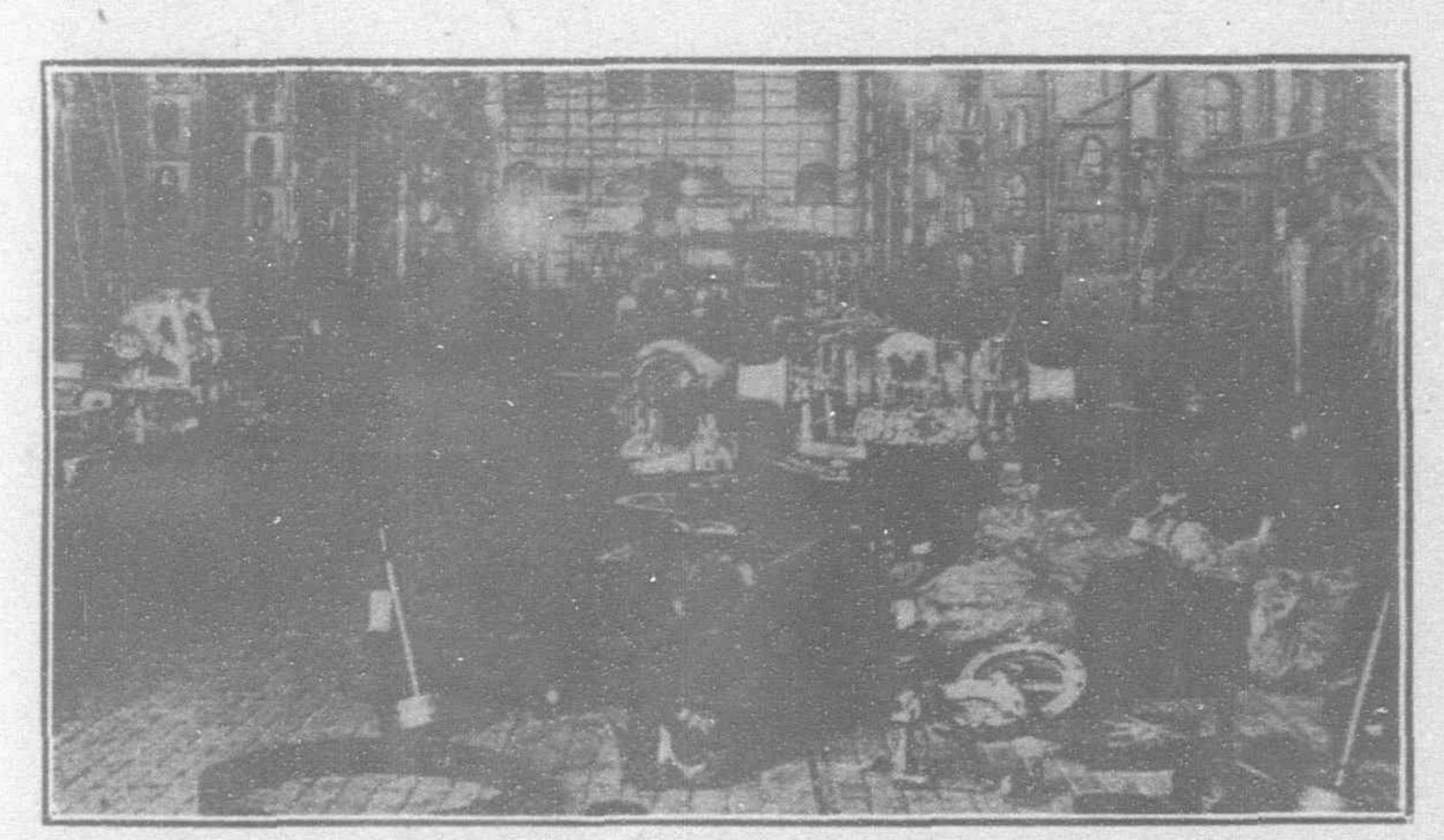


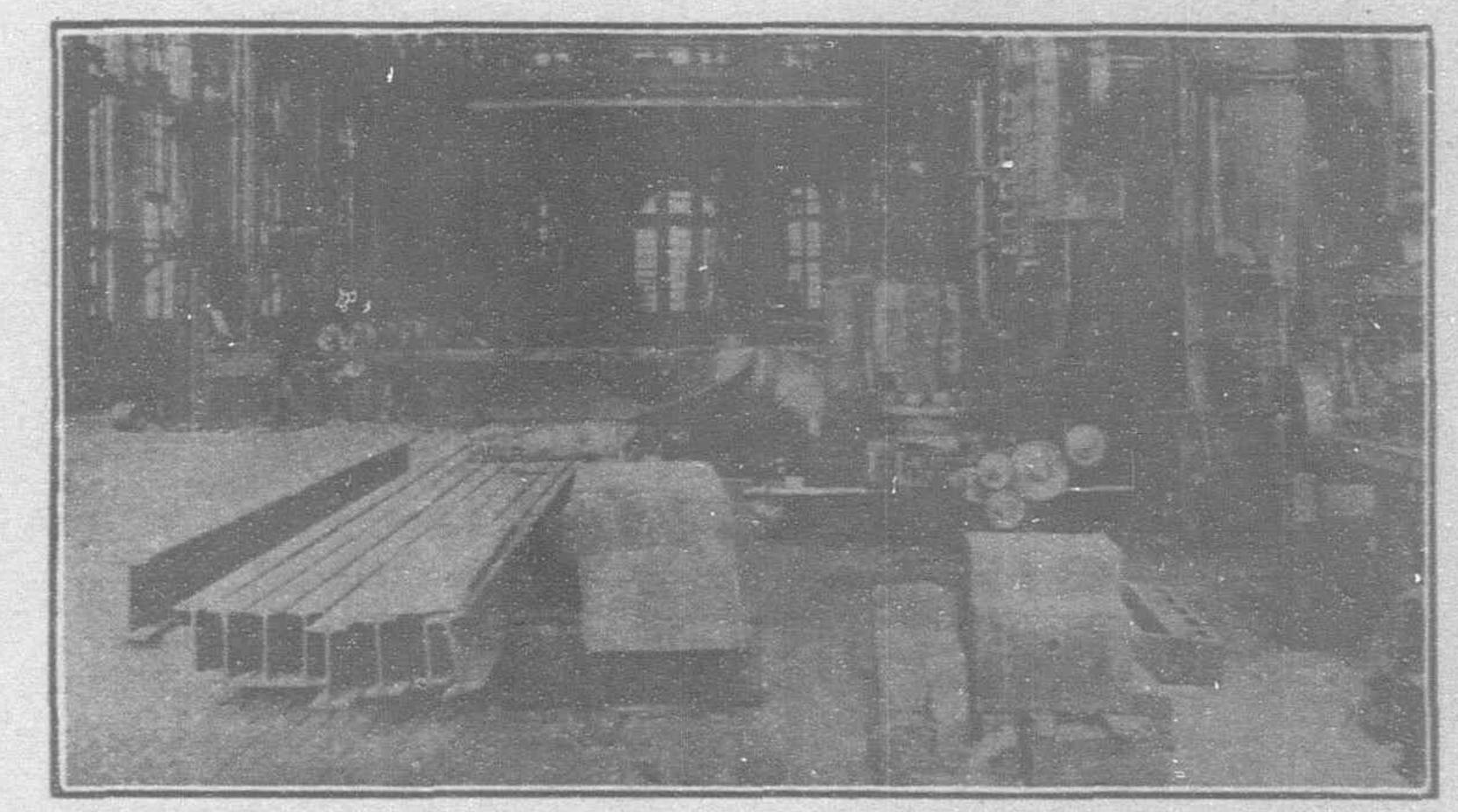
THE PLATE-BENDING SHOPS



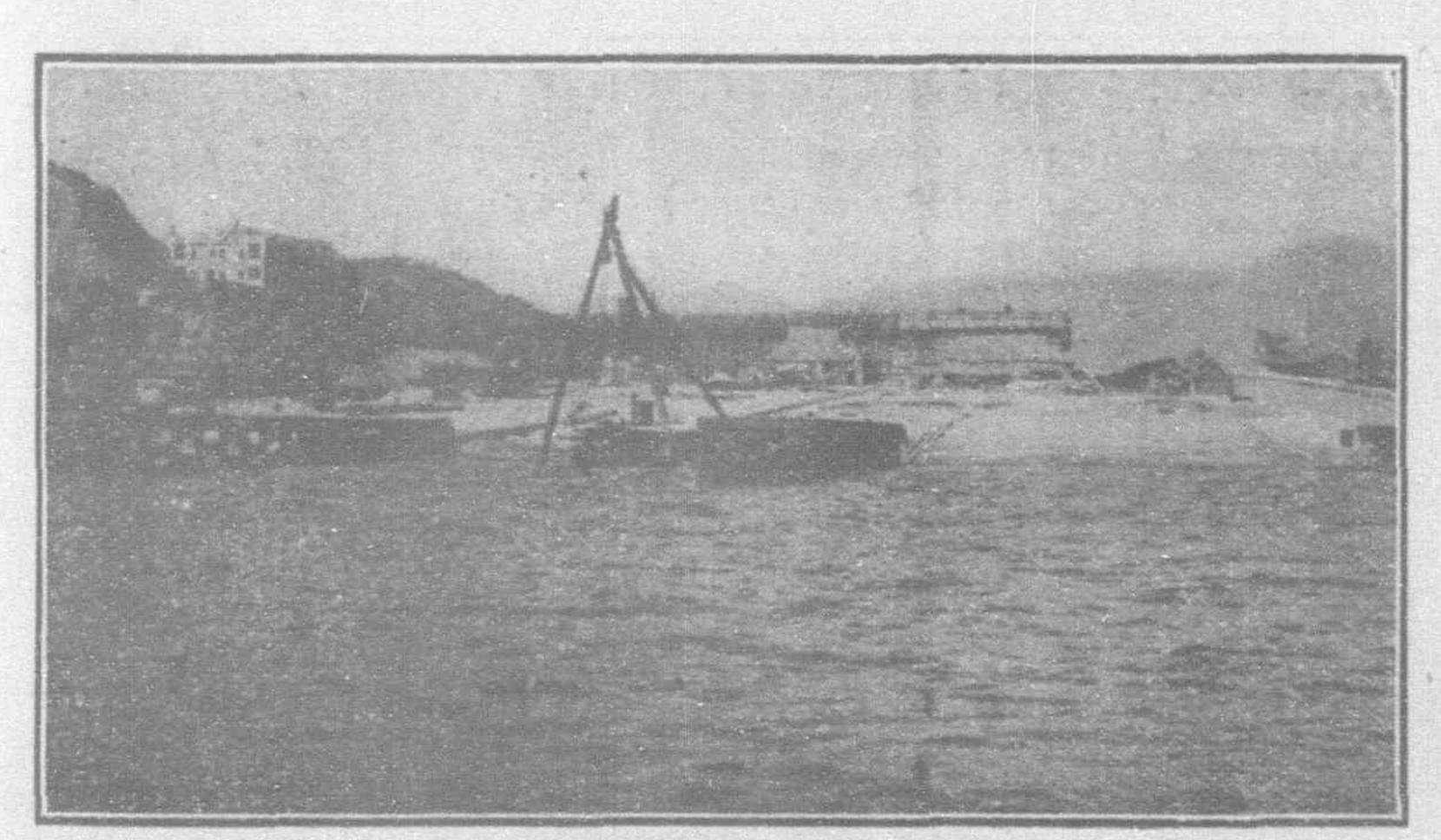


VIEWS OF MACHINE SHOPS

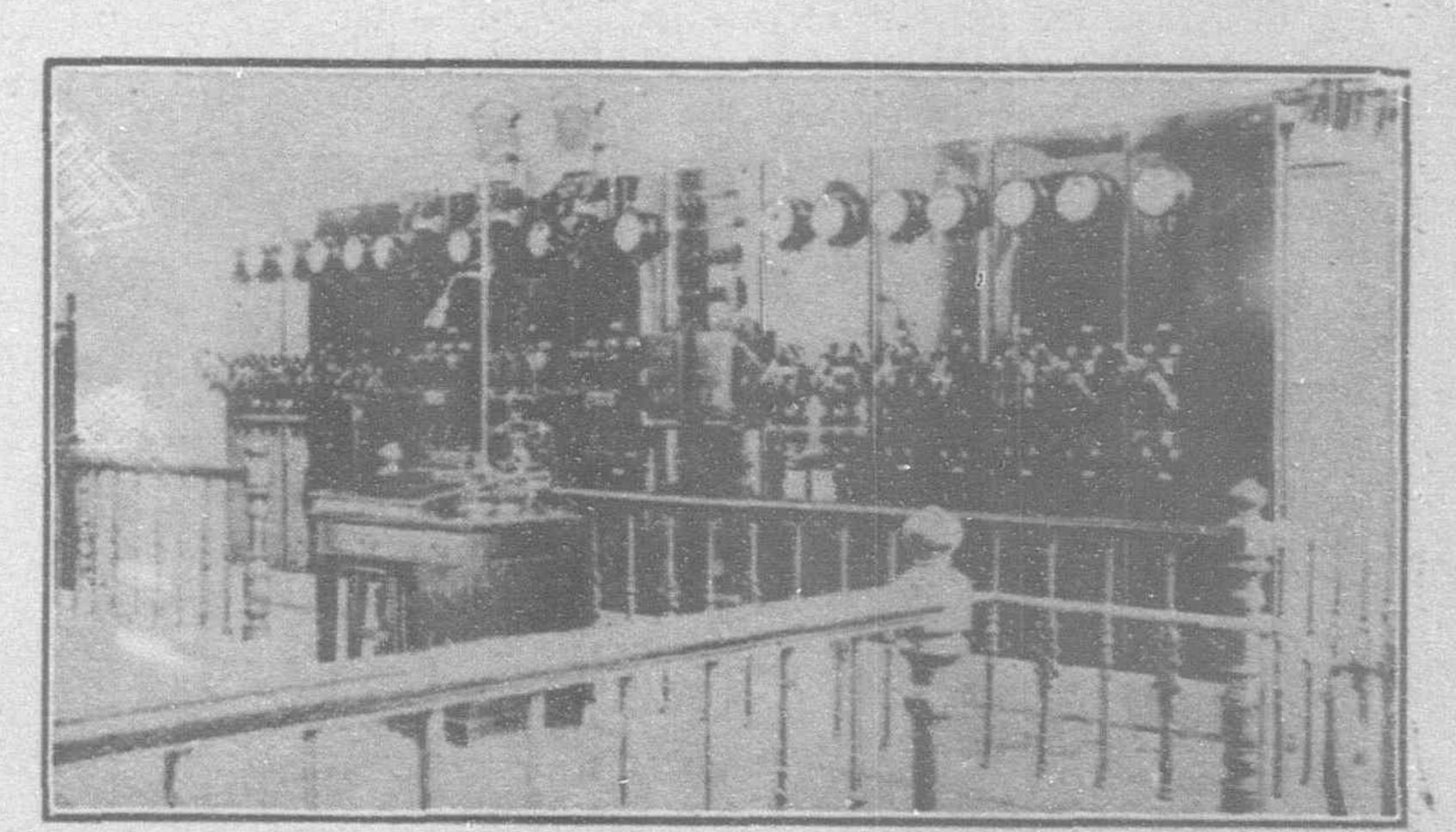




VIEWS OF MACHINE SHOPS,



New Shipbuilding Berths



Power House

drawing 17-ft. and of 2,000 tons displacement.

drums electrically driven, the hauling gear being

operated by two sets of electric motors of 225

circumference, while the No. 2 and No. 3 slipways

whole establishment is supplied from a central

electric station, the generators being driven by

gas engines of the Cockerill-Westgarth type

(3,000 collective horse-power) fed by Mond gas

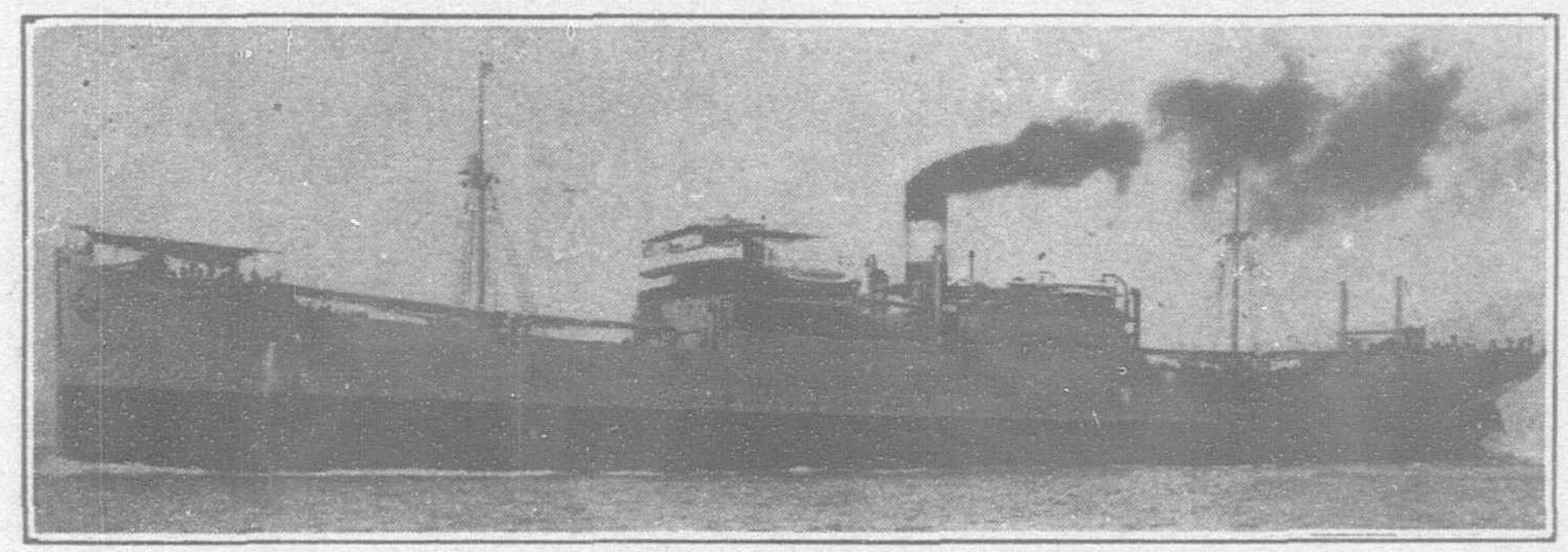
cables are each 12-in. circumference.

The cable for the No. 1 slipway is 131-in.

Steel pierheads give a fair lead to ships

Motive Power.—The motive power for the

Such a vessel can be hauled up in 30 minutes.



S-S. "War Trooper," 8,000 tons

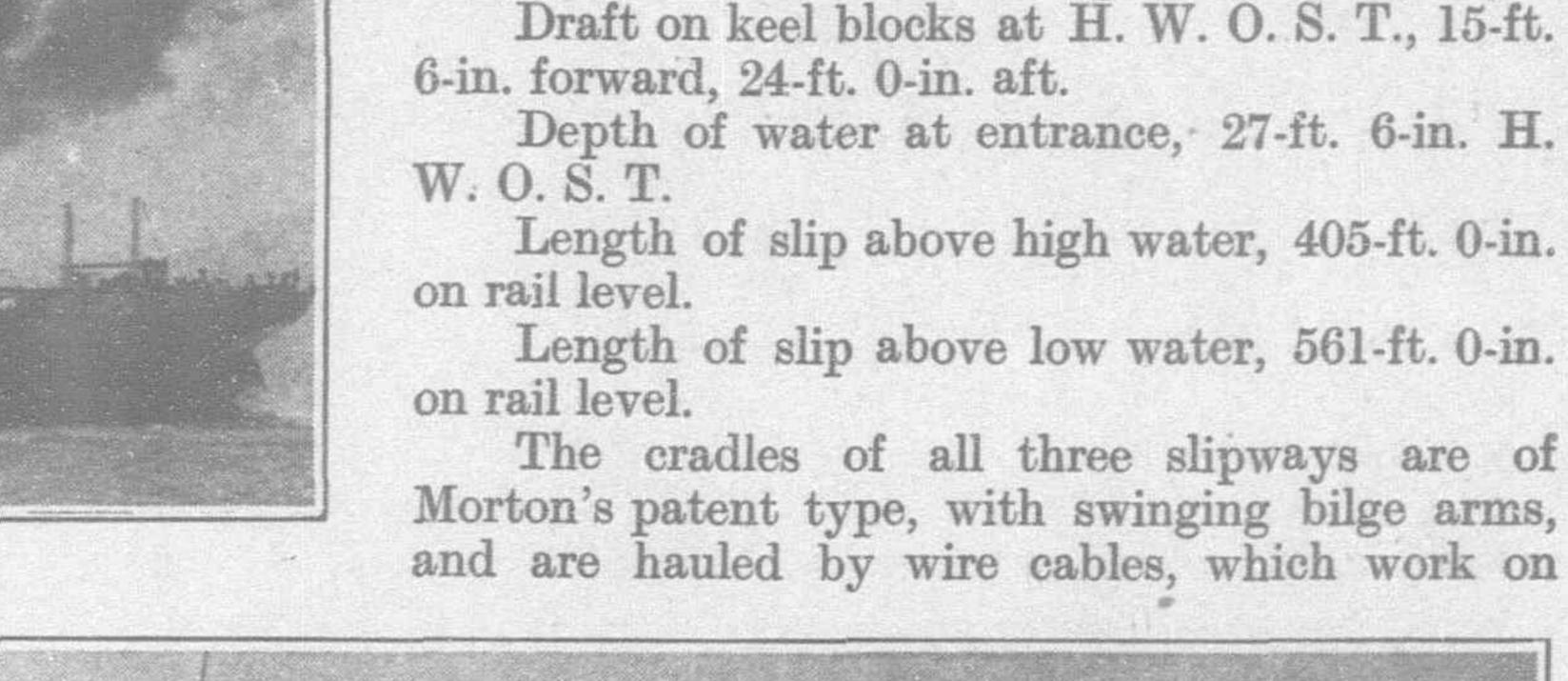
electrically driven, and can be hauled across the sill to its chamber in 4½ minutes.

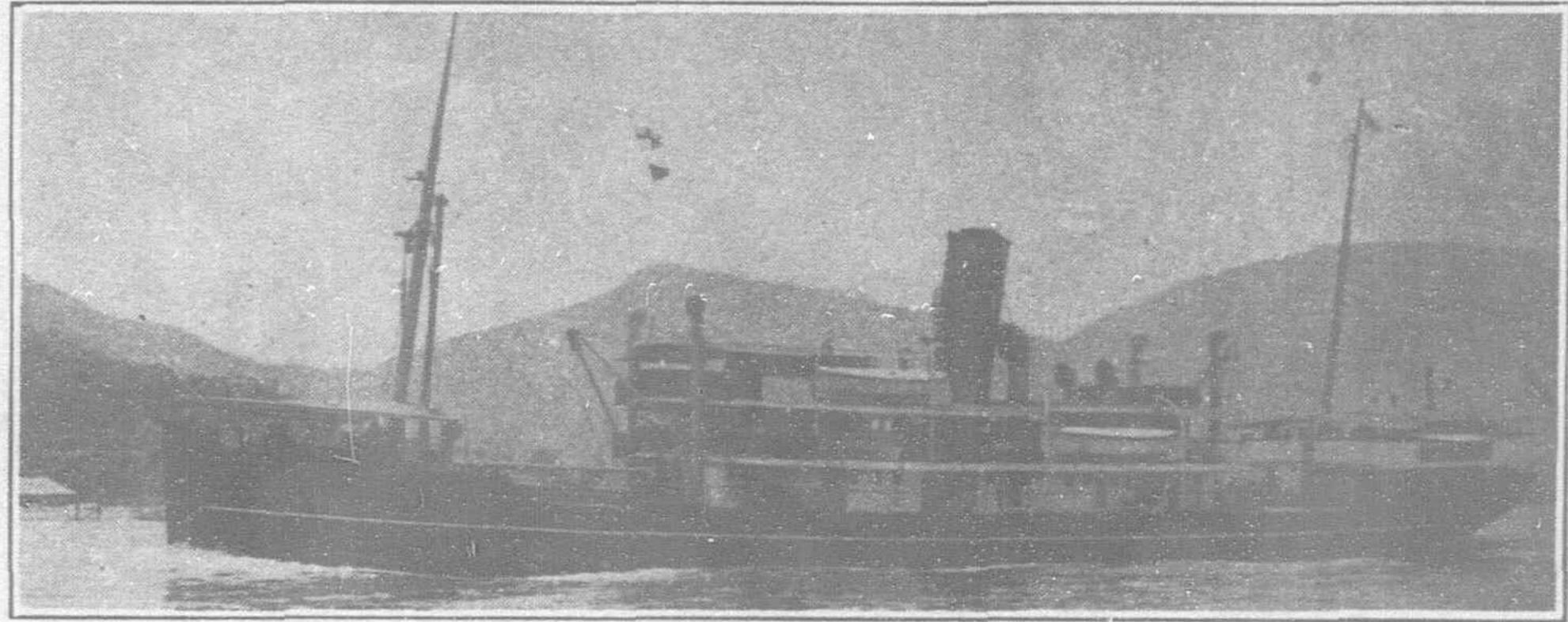
The dock can be filled in 45 minutes, and the pumping plant consists of two powerful centrifugal pumps, which are together capable of pumping out the dock, without any vessel in it, and with 34-ft. 6-in. depth of water on the sill, in less than three hours.

Railway tracks run on both sides of the dock, with travelling cranes up to 20 tons' lifting capacity.

Slipways

No. 1 Slipway—1,030-ft. long by 80-ft. wide, length of cradle 270-ft.—is capable of taking up





S.S. "Valaya," 225-ft. by 35-ft. by 13-ft.

B. H. P. each.

entering all three slips.

supplied from four producers.

S.S. "Kwai Sang," 290-ft. by 42-ft. by 25-ft.

steamers 325-ft. long, drawing 18-ft., and of 3,000 tons displacement. Such a vessel can be hauled up in about 45 minutes—smaller steamers in proportionately less time.

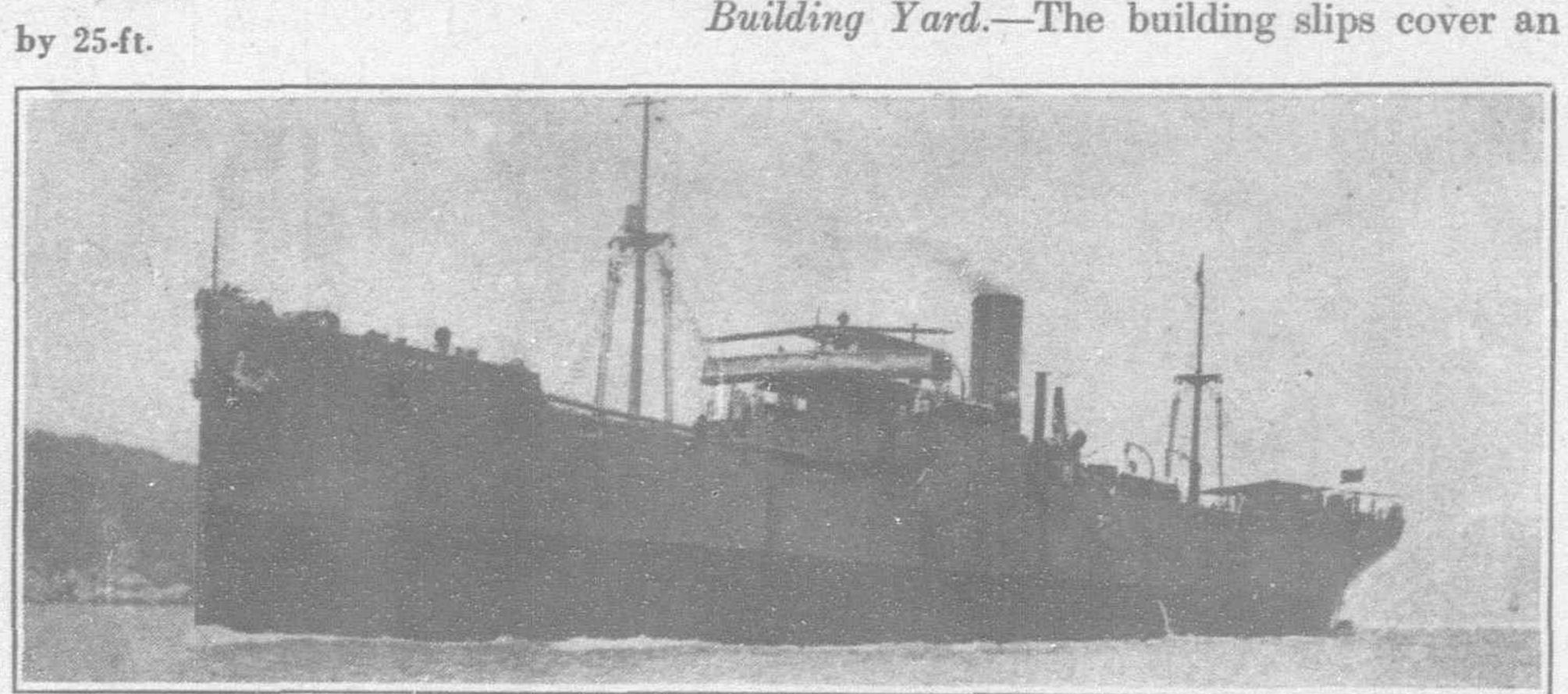
Draft on keel blocks at H. W. O. S. T., 15-ft. 4-in. forward, 25-ft. 0-in. aft.

Depth of water at entrance 28-ft. 6-in. H. W. O. S. T.

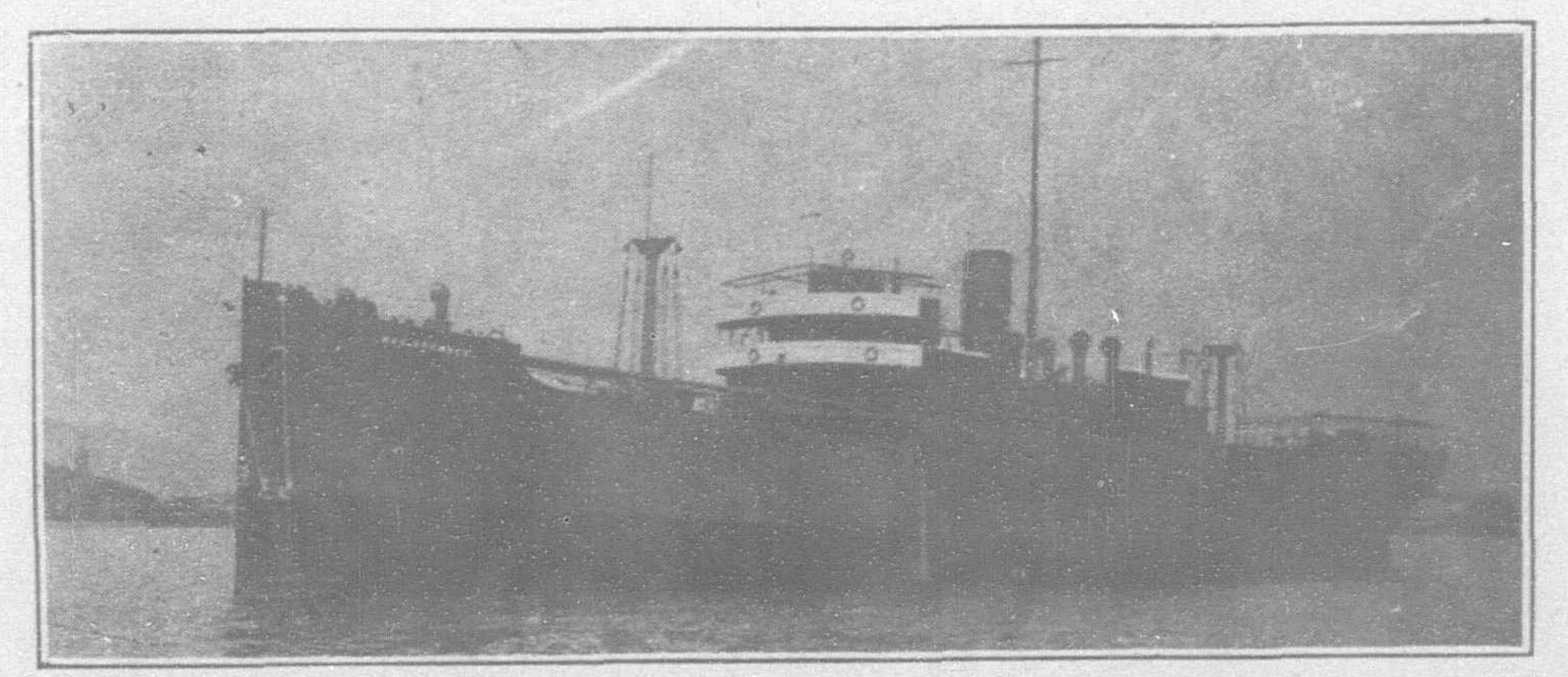
Length of slip above high water, 437-ft. 0-in. on rail level.

Length of slip above low water, 593-ft. 0-in. on rail level.

No. 2 and No. 3 Slipways—Each 993½-ft. long by 60-ft. wfde, length of cradle, 250-ft.—are each capable of taking steamers 300-ft. long,



S.S. "Warsniper," 400-ft. by 52-ft. by 31-ft. d.w., 8,200 tons; 5,175 gross; 3,500 h.p.



S.S. "War Drummer," 325-ft. by 45-ft. by 26-ft. d.w., 5,080 tons; 3,102 gross; 1,700 h.p.

area measuring 550-ft, long by 500-ft. wide, and are fully equipped for every description of constructional work.

Conveniently grouped round the building yard are the platers' shops and sheds, moulding lofts, carpenters' and joiners' shops, saw mill, etc.

Main Workshops.—The main workshops, which are equipped with the latest type of machinery and tools for dealing with all classes of work, and are also fitted with electric overhead travelling cranes up to 100 tons capacity, cover over five acres of ground, and comprise boiler shops, erecting shops, heavy and light machine shops, forge and smithies, iron and brass foundries, coppersmiths' shop, etc.

TYPES OF STEAMERS BUILT AND ENGINED BY THE HONGKONG & WHAMPOA DOCK CO., LTD.

The machine shops and boiler shop are supplied with machines of the heaviest description, capable of turning out work of the largest class. The boiler machinery is capable of dealing with plates 30-ft. long, 13-ft. wide, and up to 2-in. thick. Boiler repairs and any other work of a like nature can be carried out by means of electric welding and oxy-acetylene processes by experienced workmen.

The forge and smithy, in addition to the small power hammers for ordinary smithy purposes, are supplied with a gas forging furnace and an 8,000 tons hydraulic forging press, for work up to 3-ft. in diameter, while the foundry can turn out castings up to about 25 tons.

Quay Wall.—The quay wall, built of concrete blocks, is 3,200-ft. long. For the greater part of its length there is 40-ft. depth of water H.W.O.S.T., enabling ships of any size to berth alongside when required at all states of the tide.

Situated at a convenient point on the wall is an electric crane, capable of lifting 100 tons at a 70-ft. radius, and smaller weights at a larger radius. Wagon and crane roads run along the quay, with a 20-ton and other lighter travelling cranes available to deal with loads at any point thereon.

Towage and Launch Services.—Powerful steel tugs attend when required upon all steamers using the yards, and are available for service further afield, by special arrangement. There are also numerous steam launches available for all minor harbor requirements.

Twin-Screw The Salvage Tug "Taikoo" (1,500 I.H.P.) is equipped with powerful fixed steam-driven salvage pumps, also heavy lifting gear suitable for undertaking salvage work of any kind at short notice. The vessel has also a large hold in which all the necessary gear for salvage work can be carried. Portable salvage pumps, boilers, diver's pumps and gear, are always kept ready for immediate despatch.

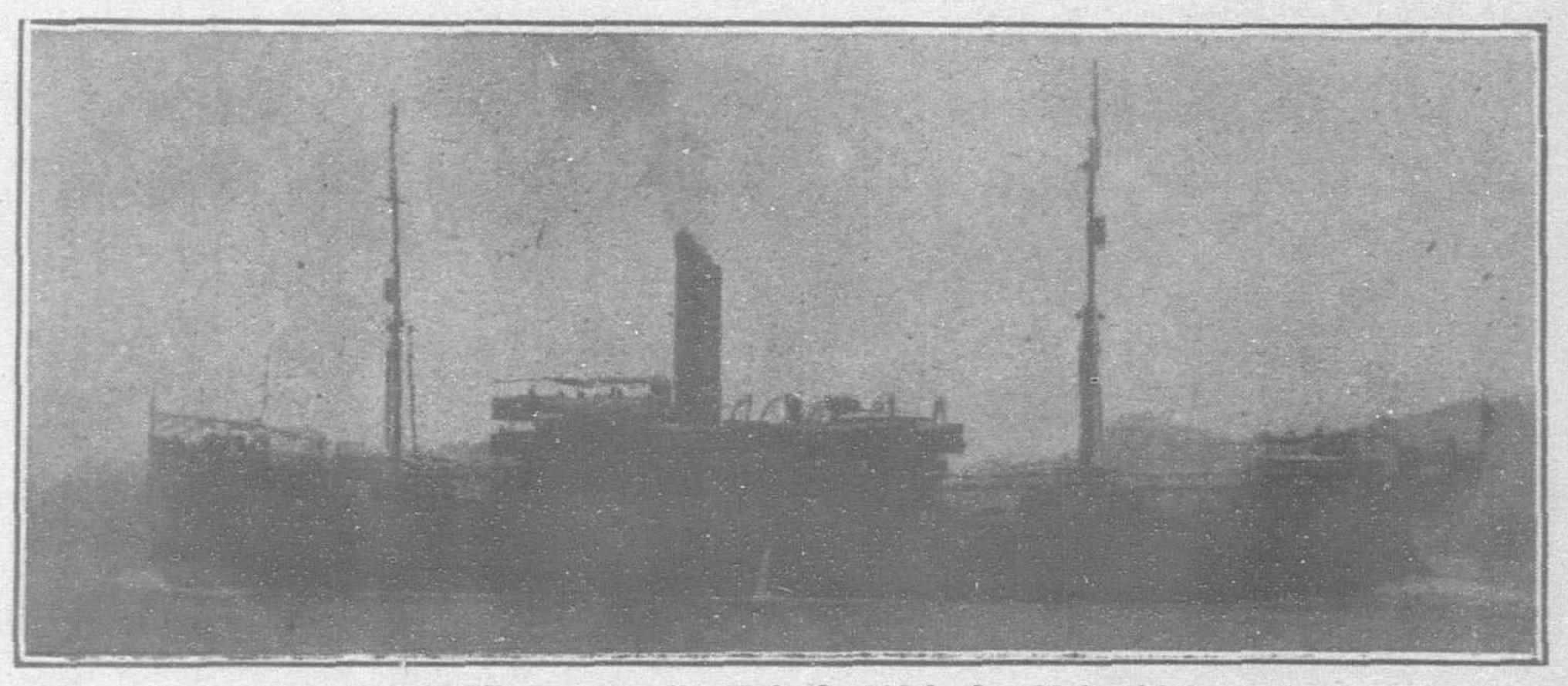
A European diver, skilled in salvage work, is always available. dealing with any engineering problem that may be presented—the whole place is lighted and driven electrically—all overhead electric travelling cranes for the quick handling of material. The number of men employed at present is nearly 10,000.

In addition to the building of new ships the Company has dealt with a vest amount of repairing and reconditioning work.

In addition to the building of new ships the Company has dealt with a vast amount of repairing and reconditioning work and has also converted a number of sailing ships into motor-driven oil "Tankers." The new shipbuilding berths are nearing completion and are capable of taking ships up to 750-ft. in length—the sawmill, joinery and other shops are to be situated on the new ground, so that there will be a minimum in handling of material. Cranes of the most approved type will be fitted along the slipways for the expeditious handling of all steel work in connection with ship construction.

THE DIMENSIONS OF DOCKS & SLIPS ARE AS FOLLOWS:

| | ength · | Entrance | Depth over Sill | Rise of | f Tide |
|---|---------|----------------------|-----------------------------|---------|--------|
| В | locks | Breadth | at Ordinary Spring Tides | Springs | Neaps |
| KOWLOON | | | | | 4 |
| No. 1 Dock, Kowloon | 700' { | 86' top 70' bot'm | 30' | 7' 6" | 3' |
| No. 2 Dock, Kowloon | 371' | 74' | 18' 6" | 7' 6" | ***** |
| No. 3 Dock, Kowloon | 264' | 49' 3" | 14' | 7' 6" | ***** |
| Patent Slip, No. 1, Kowloon | 240' | 60' | 14' | 7' 6" | ***** |
| Patent Slip, No. 2, Kowloon TAI-KOK-TSUI | 220' | 60' | 12' | 7' 6" | ****** |
| 그 시장으로 하는 것을 가는 그 그리고 있는 것을 하는데 | 466' | 85′ 6″ | 20' | 7' 6" | ***** |
| _= | 430' | 84' | 23' | 7' 6" | ****** |
| | 333' | 64' | 16' | 7' 6" | ****** |



S.S. "Prominent," 270-ft. by 40-ft. by 21-ft. 6-in.

The S.S. "Prosper," S.S. "Hermeliss" and S.S. "Helikon" were built to similar dimensions.

THE TAIKOO DOCKYARD & ENGINEERING COMPANY OF HONGKONG, LIMITED.

List of Ships and Engines built during 1919.

| Name of Vessel. | Type Tr | Board of ade Gros Tonnage. | | Built for |
|-------------------------|-------------------------|----------------------------------|----------------|---|
| Laertes | Steel Screw Steamer | 5,806 5,201 | 3,500 | Messrs. A. Holt & Co. British Government |
| War Driver War Miner | do. do. | 5,201 | 2,850 | do. |
| War Bugler St. Day | do. Steel Rescue Tug | 5,201 | 2,850 1,200 | |
| St. Dogmael | do. | 451 | 1,200 | |
| | | 22,311 | 14.450 | |

The Hongkong and Whampoa Dock Co., Ltd.

The dock Company's properties cover 88 acres; there are six granite dry docks, taking vessels up to 700-ft. in length, also two slipways which take vessels up to 2,000 tons; there are a number of shipbuilding ways where during the war eight vessels were under construction at the same time. There is also nearing completion the new extension to the shipbuilding yard where 3 new ways are laid down for the building of vessels up to 750-ft. in length—that is to say they are prepared to build ships much larger than have ever been seen in the port of Hongkong. There is a new dry dock of 1,000-ft. under consideration for building in the near future, and this will accommodate anything likely to come to the East. The engine fitting, machine, boiler, blacksmith, foundry, coppersmith and kindred shops are all fully equipped and capable of

Other Dockyards

One is not able to say much about the Royal Naval Dockyard but any visitor to the Colony can see that it occupies a large area of ground, in a very prominent position of the city.

There are two other smaller British ship-yards and ten owned and managed by Chinese. In 1916 there were actually T.R. vessels built in the Colony practically all of which are propelled by steam or motors. And

There is also an important local industry connected with the building and rapairing of launches and motor-boats.

of these Taikoo firm heads the lists.

The above facts and figures and the accompanying illustrations will give some indication of the importance of shipping to the Colony of Hongkong and to the reader will help him to understand something of what is meant when one speaks of shipping and shipbuilding being the life blood of the Colony.

Nos. 1 to 11 were all built by the Hongkong and Whampoa Dock Co., Limited.

No. 1. War Snipper ... $400' \times 52' \times 31'$ d.w., 8,200 tons, 5,175 tons gross—3,500 H.P.

No. 2. War Bomber ... $400' \times 52' \times 31'$ d.w., 8,200 tons, 5,175 tons gross—3,500 H.P.

No. 3. War Drummer ... $325' \times 45' \times 26'$ d.w., 5,080 tons, 3,102 tons gross—1,700 H.P.

No. 4. Chak Sang $290' \times 42' \times 25'$ No. 5. Kwai Sang $290' \times 42' \times 25'$ No. 6. Prosper $270' \times 40' \times 21'$ 6" No. 7. Prominent $270' \times 40' \times 21'$ 6"

No. 8. Hermelin 270' × 40' × 21' 6" No. 9. Helikon 270' × 40' × 21' 6"

No. 11. Valaya... ... 223' × 35' × 6" 13'

II.—SHANGHAI

. SHIPBUILDING in Shanghai during the current year received considerable impetus as a result of orders placed during the war by foreign governments. In the November number of The FAR EASTERN REVIEW we printed a full description of the work and yards of the New Engineering and Shipbuilding Works, a concern which is rapidly forging ahead and taking its place as one of the premier shipbuilding plants in the Far East. The older established Shanghai Dock and Engineering Company has also been most active and during the year 1920 launched and completed two large standard steamers for the British government and six steel cargo vessels each of 300 tons deadweight capacity for local owners, also one large steel twin-screw passenger and cargo steamer 340 feet by 47 feet beam for the China Merchants' Steam Navigation Company. Work is proceeding on two large passenger and cargo steamers of about 340 feet long, one steel cargo hulk to carry 3,000 tons deadweight and a twin-screw Yangtze gunboat for the Italian government. Several smaller craft were also launched during the year.

We have pleasure in showing the s.s. Mellon ex s.s. War Regalia, one of the three British standard ships on trial trip, fine examples of the shipbuilding art. She developed close on 14 knots per hour on trial trip.

These ships were sold by the British government to Greek owners and are sure to prove a decided aquisition to that nation's commercial fleet.

A Chinese dockyard under foreign technical direction has launched two large standard steamers for a foreign government and work is proceeding on the other two: they also launched many river and small craft.

The Shanghai Times, in comparing the present and future prospects of the port, says there are several points in favor of

the Shanghai shipyards, notably the fact that primarily they are all ship repairers and the building section is a sort of auxiliary part and while new building may at times be inclined to slack off, repair work as a rule will be fairly constant more especially with the large number of new ships visiting the port. The local builders have every possible facility with which to construct and complete vessels in their own yards and workshops: engines and boilers and auxiliary machinery are all under the same control and conditions and are arranged to progress with the construction of the vessels themselves, independent of outside conditions. This is a factor of great value and only possessed by very few shipbuilders in other parts of the world.

In summing up the present position and future prospects, Shanghai's two commercial shipbuilders have reason to feel satisfied with themselves—when labor in other countries and cost and speed of construction revert to

pre-war records, then building locally will be subject to very severe competition and under many handicaps but with present conditions in England and America and prospects of little improvement in the near future, China with her tremendous labor facilities is bound to come to the front and none are better able to make the most of this opportunity than the shipbuilding and engineering yards in Shanghai.

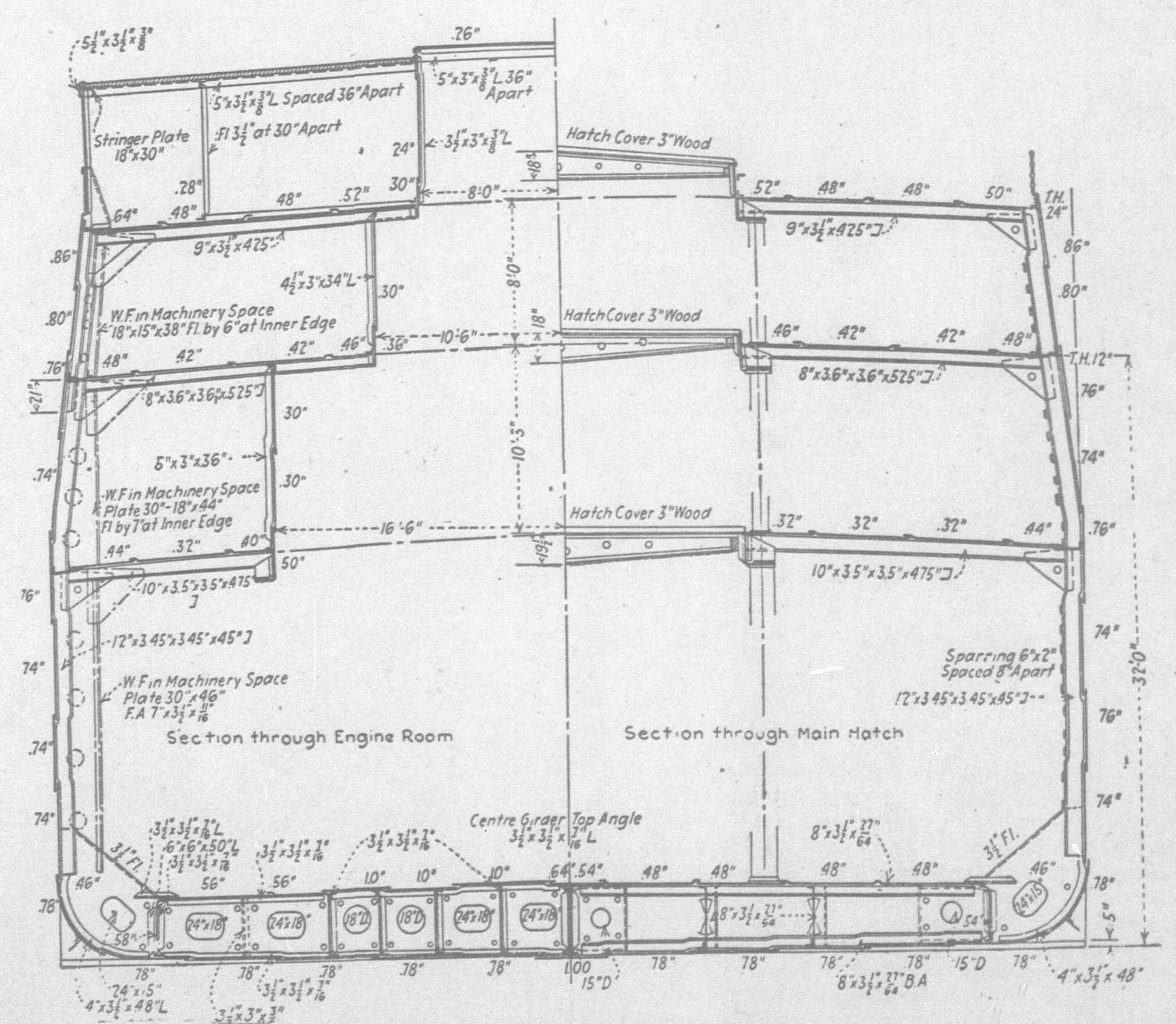
III.—JAPAN

The 13,000-ton Freighter "Eastern Merchant"
Built by the Asano Shipyard for the United
States Shipping Board

By C. Ano, Director, Asano Shipbuilding Co.

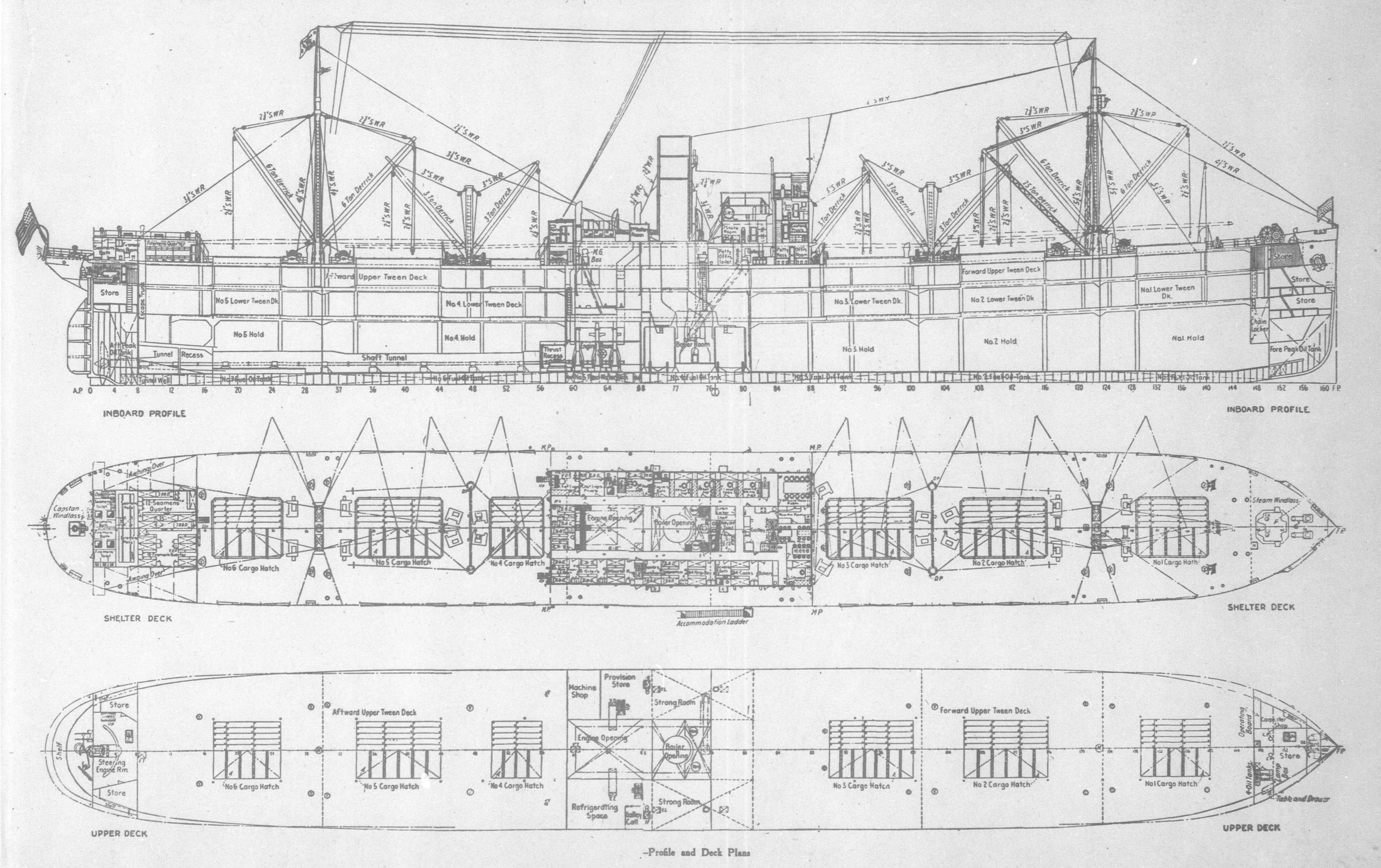
DURING the late war, Japanese shipbuilders suffering from a lack of steel materials negotiated with the United States government to built cargo steamers for them and to get steel in return. As a result of these negotiations two series of contracts were arranged between the United States Shipping Board and representatives of the Japanese shipbuilders.

The first series of contracts, which were signed during April, 1918, provided for the sale of twelve steamers of 100,800 tons deadweight by the Japanese shipbuilders at the rate of \$225 to \$275 per deadweight ton and for the release for export of 100,800 tons of steel already ordered by the Japanese shipbuilders from the various steel mills in the United States. The shipbuilders concerned in these contracts were the Asano Shipbuilding Company, Kawasaki Shipbuilding Company, Osaka Iron Works, Suzuki



'Midship Section S.S. "Eastern Merchant

Japanese-Built Cargo Ship "Eastern Merchant," Constructed by the Asano Shipyard for the U. S. Shipping Board.



Company and Uraga Dock Company. Most of the ships under these contracts were, at the time of signing the contracts, ready for sea or in an advanced state of building, and contributed great assistance to the Allies in carrying war materials across the Atlantic. Later on three steamers having a total deadweight capacity of 27,000 tons were added to this series of contracts by the Kawasaki Shipbuilding Company.

The second series of contracts were signed in May, 1918, and their principal terms provided that the Japanese shipbuilders were to build and supply the ships to the United States government at the rate of \$175 per deadweight ton and that the United States government was to supply the builders with half as many tons of steel material as the deadweight tonnage of the ships they supplied.

Following is the complete list of the shipbuilders and number and tonnage of the ships they are building under these contracts:

| Builders | Number of Ships | Deadweight Tonnage of Each Ship | Total Deadweight Tonnage |
|--|--|---------------------------------------|--------------------------------|
| Asahi Shipbuilding Company | 1 | 5,500 | 5,500 |
| | 2 | 13,000 | 26,000 |
| Fujinagata Shipyard | 1 | 6,300 | 6,300 |
| Ishikajima Shipbuilding and En | gi- | | |
| neering Works | THE RESERVE THE PROPERTY OF THE PARTY OF THE | 5,000 | 10,000 |
| Kawasaki Shipbuilding Company | 5 | 9,000 | 45,000 |
| Mitsubishi Shipbuilding Company | 2 | 8,400 | 16,800 |
| Mitsui Company (Uno Shipyard) | 2 | 9,100 | 18,200 |
| Nitta Steamship Company | 1 | 5,500 | 5,500 |
| Osaka Iron Works | 4 | 10,500 | 42,000 |
| Suzuki Company (Harima yard) Suzuki Company (Harima yard) | 1 | 5,000 } | 15,500 |
| Uchida Shipbuilding Company | 2 | 8,500 | 17,000 |
| | 3 | 6,650 | 19,950 |
| Yokohama Dock Company | 3 | 6,300 | 18,900 |

GENERAL ARRANGEMENT

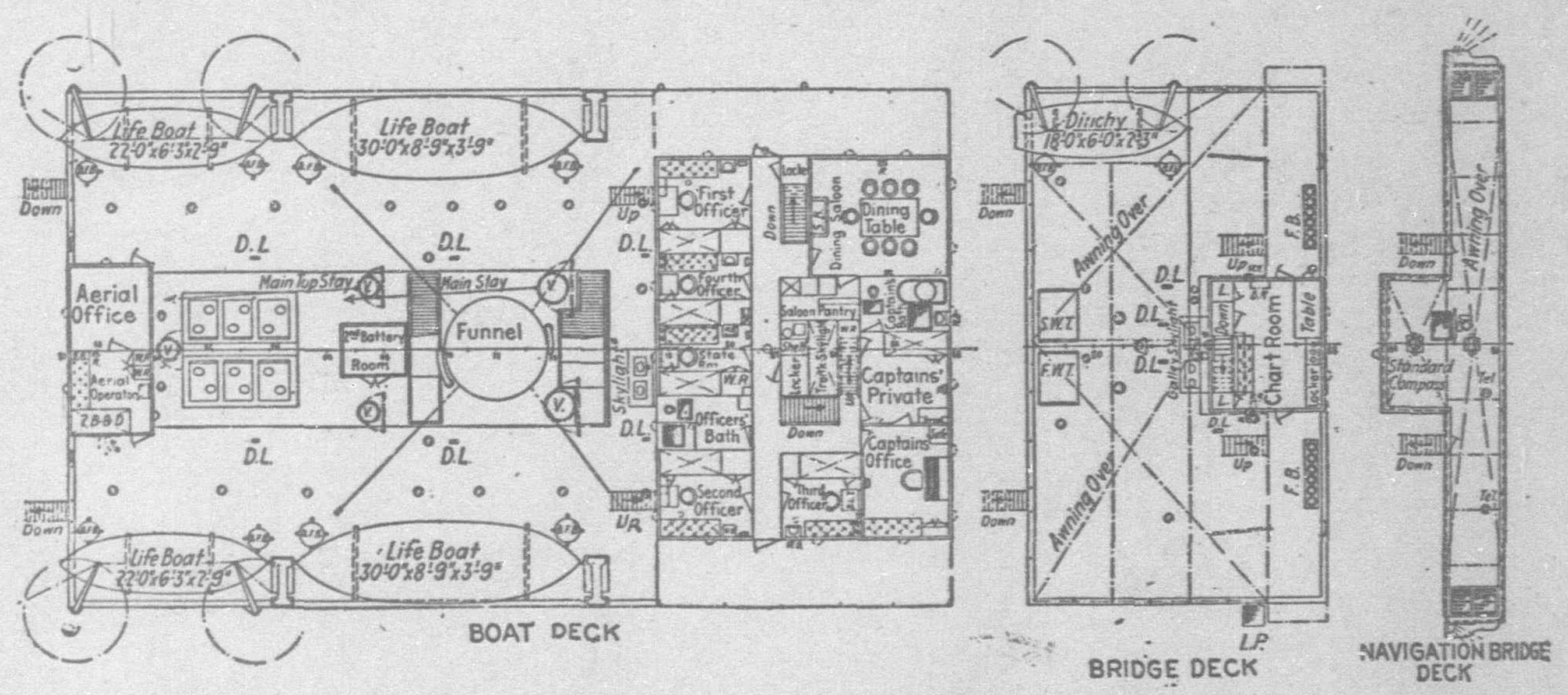
The general arrangement is shown in the accompanying plans, from which it will be seen that the steamer is of the shelter deck type with three continuous decks, which are of steel throughout. Above the shelter deck there are steel deck houses to accommodate the officers and crew, the top of the midship house being extended to form a boat deck. There are seven steel water-tight bulkheads, four of which extend to the shelter deck, and the others to the upper deck. A cellular double bottom extends the full length of the ship between the peak bulkheads, all of which will be used for the stowage of fuel oil, except the part under the engines, in which reserve feed water will be carried. The fore and aft peak tanks are also arranged for fuel oil. The total capacity of the fuel oil tanks, including the large settling tanks, is 1,768 tons, which will give the ship a steaming radius of about 11,000 miles.

FRAMING

The vessel is framed transversely, the frame spacing being generally 36 inches, reduced to 27 inches in No. 1 hold and to 24 inches in the peaks. Plate floors in the double bottoms are arranged on alternate frames, the intermediate floors being of bulb angle section, supported by flanged bracket plates. Widely spaced pillars of tubular section are arranged in the holds and 'tween decks, thus providing clear spacious holds for the storage of cargo. No side stringers are fitted except in the forward portion.

ACCOMMODATIONS

Accommodation for the officers and engineers is as shown on the illustration. The house on the boat deck is allotted exclusively for deck officers, the port side of the 'midship house for engineers,



Plans of Boat and Bridge Decks, S.S. "Eastern Merchant"

arranging for quick delivery from the steel mills, none of the keels of the ships could be laid before the armistice. Among those ships the two Asano steamers are considered fine specimens of Japanese naval architecture, being the largest and only twin-screw vessels built in Japan for the United States government. The description of the first ship, Eastern Merchant, given herein will be sufficient to give a general idea of both ships.

PRINCIPAL DIMENSIONS

The principal particulars of the Eastern Merchant are as follows:

| Length overall | 461 feet 7 inches |
|---------------------------------------|-------------------|
| Length between perpendiculars | 445 feet 0 inches |
| Breadth, moulded | 58 feet 0 inches |
| Depth, molded to shelter deck | 40 feet 1 inch |
| Load draft | 30 feet 4 inches |
| Gross tonnage | |
| Net tonnage | |
| Deadweight capacity | |
| Capacity for bale cargo at 40 cubic t | |

In spite of the great effort of the United States government in the starboard side for the steward and petty officers, and the after deck house for the exclusive use of the seamen and firemen, each quarter having a spacious and well equipped mess room. The saloon, captain's and chief engineer's cabins have been given special attention, the rooms being very tastefully finished in Japanese oak and pine. All officers' and crew's rooms are spacious, well ventilated and lighted and have been arranged to suit the special requirements of the American owners.

CARGO HANDLING ARRANGEMENTS

The loading and discharging arrangements are of a very efficient character. Eighteen wooden derricks and and heavy steel derrick are provided to load and discharge cargo through six large hatchways, with the aid of 7-inch by 12-inch double geared horizontal steam winches. As will be seen in the accompanying plan, the two steam winches forward of No. 2 hatch are arranged for heavy lifts to work on a large lifting drum placed on the ship's centreline, through forged steel clutches, and with the topping arrangement leading to a similar drum connected to the No. 1 winches. This arrangement enables a quick and safe working of cargoes of large weights.

ANCHOR HANDLING

There is a powerful spur geared anchor windlass and a capstan engine aft for anchoring and mooring purposes. The bower anchors are of the Ohshima patent stockless pattern and are stowed in the hawse pipes.

STEERING GEAR

The steam steering engine is of Brown's patent steam tiller type actuated from the bridge through telemotor gears. An electrical rudder head telltale is provided so that any disturbance in the telemotor system can be readily noticed by the officer on watch. The ship has been arranged for the installation of wireless apparatus, but this has not been fitted by the shipbuilders.

PROPELLING MACHINERY

The propelling machinery of the ship consists of two sets of triple-expansion engines, constructed by the Kubota Iron Works of Osaka. The particulars of each main engine are as follows:

Diameter of high pressure

cylinder 22 ins.

Diameter of intermediate

pressure cylinder ... 36½ ins. Diameter of low pressure

cylinder 61 ins. Stroke 48 ins.

There are two main condensers, each having a cooling surface of 2,700 square feet. Each of the propellers has four detachable manganese bronze blades with a cast iron boss. The diameter and pitch of the propellers is 16 feet and 18 feet respectively.

Steam is generated by four single ended return tube boilers working under Howden's system of forced draught. The particulars

of the boilers are as follows:

Diameter 14 feet 3 inches Length 11 feet 6 inches Working pressure 200 pounds per square inch

Grate area... 58.2 square feet Heating surface... 2,458.8 square ft.

The engine and boiler room auxiliaries include the following:—

Auxiliary condenser: One, of 600 square feet cooling surface.

Circulating pumps: Two sets, centrifugal type.

Independent feed pumps: One pair, size $10\frac{1}{2}$ inches by 8 inches by 24 inches.

Independent bilge pump: One, size $6\frac{1}{2}$ inches by $6\frac{1}{2}$ inches by 6 inches.

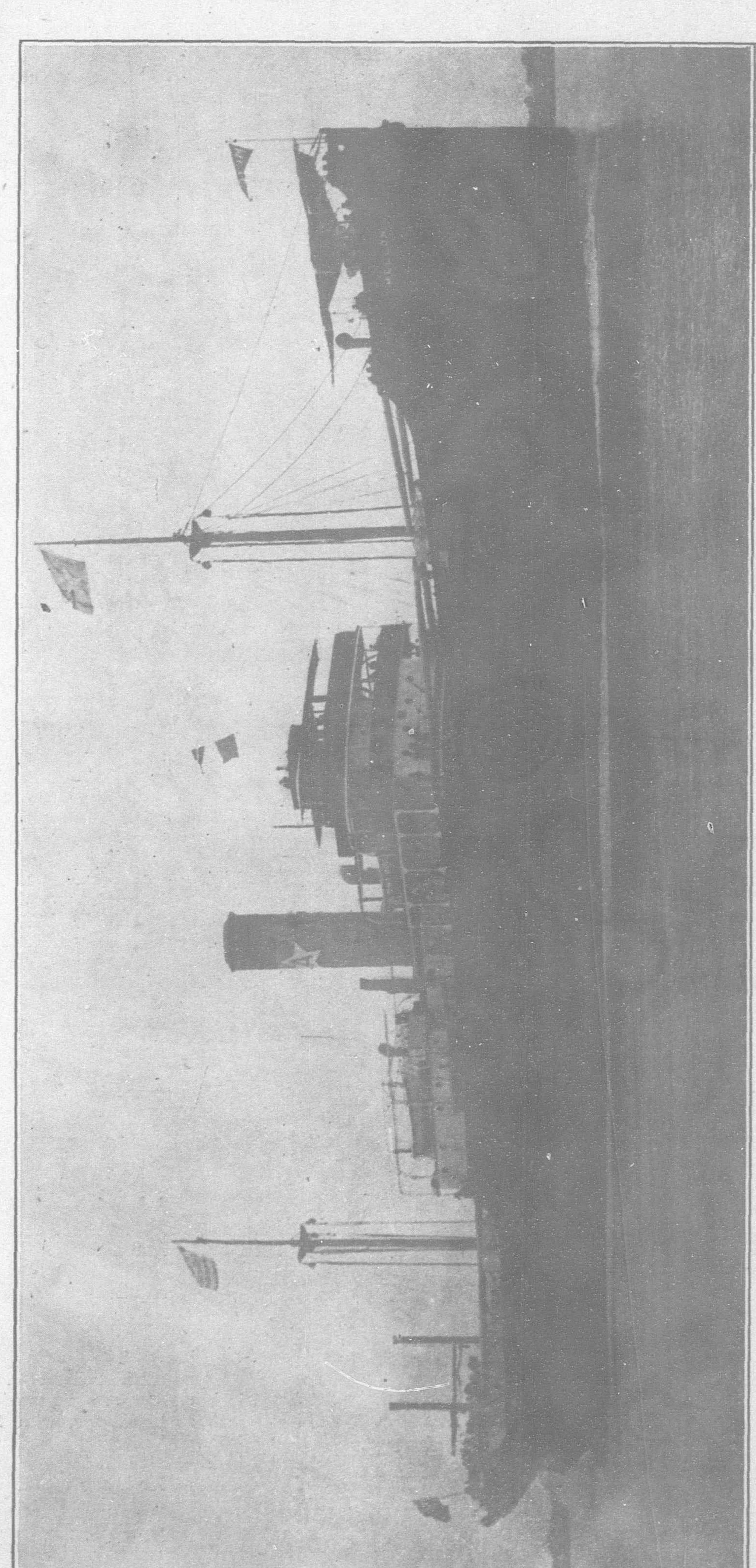
Ballast pump: One, size 9 inches by 12 inches by 10 inches.

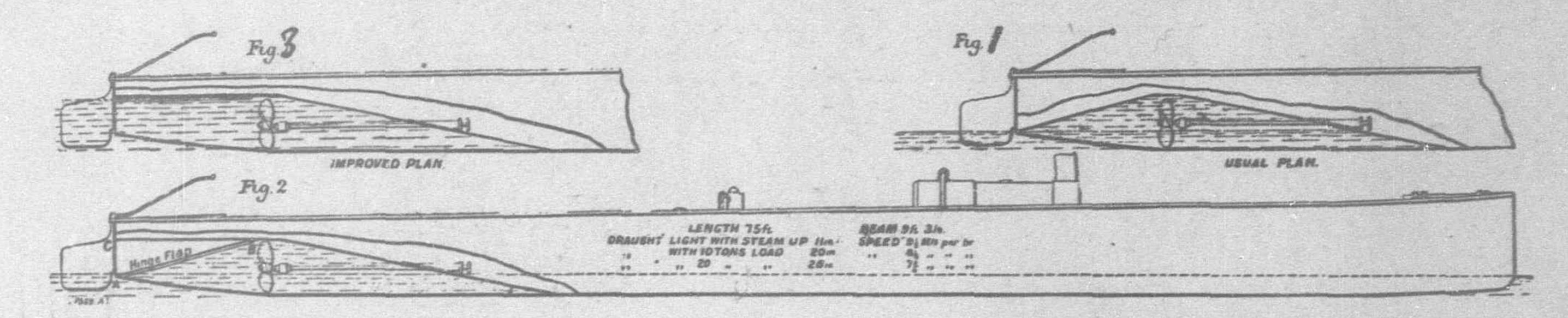
General service pump: One, size 10 inches by 6 inches by 10 inches.

Oil shifting pump: One, size 10 inches by 7 inches by 10 inches.

In addition, there is a 20-ton evaporator, an ash hoisting engine, a feed water heater, etc.

The ship is lighted throughout by electricity. Two dynamos, one of 25 kilowatts capacity and one of ten kilowatts capacity, are placed in the engine room for this purpose. Space for cold storage and ice machines was provided, but these





are to be installed in the United States after the vessel is delivered.

TRIALS

The steam trials of the Eastern Merchant and her sister ship Eastern Trader were very successful and satisfied both the owners and the shipbuilders. On the light load steam trial the Eastern Merchant attained a mean speed on double runs of 15.46 knots, while the Eastern Trader made 16.15 knots. Afterward the former ship easily made a mean of 12.7 knots on a six hours' continuous run with a total deadweight of over 11,000 tons on board, every part of the machinery being kept in normal working condition. Thus these ships proved themselves not only the largest but the fastest among the ships built in Japan for the United States government.

The keel of the Eastern Merchant was laid on April 21, 1919, and that of the Eastern Trader on May 1, 1919. Both ships had several alterations during the construction, and were launched on October 6 and November 4 respectively. Both ships had steam trials during December of the same year and were handed over to the United States government early in February, 1920, at San

Francisco.

IV.—NAVIGATING THE UPPER YANGTZE

"Knockdown" Steamers

OF the many problems which face the shipbuilder who specialises in the design of shallow draft river steamers, it is probable that the navigation of the Yangtze between Ichang and Chungking was one of the most difficult to solve. The conditions at the rapids vary in an extraordinary way, the rise of water at certain seasons being phenomenal and probably unknown in any other part of the world. The severe conditions demand a vessel which can be run at light draft, at high speed, which is easily handled, is economical to steam, and yet is capable of carrying a considerable amount of cargo and a large number of passengers.

Before 1913 H. M. gunboat Widgeon and sister vessels, built on the Yarrow system had made this passage under their own power without resorting to warping with a hawser from the

shore.

Details of the "Shu-hun"

In 1913 the twin-screw steamer Shu-hun, now so well-known on the upper reaches of the Yangtze, was designed by Messrs. Yarrow & Company of Glasgow, in co-operation with Captin Plant who has the most intimate knowledge of conditions on the Yangtze and of what was required in order to successfully navigate that difficult river.

Based on the successful Widgeon type of vessel Messrs. Yarrow & Co. were able to evolve a design and to produce the Shu-hun embodying the latest system of propulsion for shallow draft vessels, that is, by propellers working in tunnels sealed at the aft end by the Yarrow patent automatic flap. The most remarkable feature of this vessel is the large diameter of the propellers capable of utilizing the high power of her machinery,

in spite of the shallow draft at which she has to run.

Figure (1) shows the tunnel as originally constructed in vessels of this type which are designed for shallow draft. When this vessel was more heavily laden it is clear that the fixed sleping after part of the tunnel would cause a great loss of efficiency. The improved plan similar to that fitted on the Shu-hun is shown in Figure (2) where the hinged flap is clearly seen in position AB. With this improved arrangement when the vessel is more heavily laden the flap automatically rises to the position CB, Figure (2) or as shown in Figure (3), and the efficiency of propulsion is thereby greatly increased. For the sake of clearness, Figures (1), (2) and (3) illustrate only a small launch, but the principle is the same as on the Shu-hun.

There is no doubt that the great success of the Shu-hun is due to the adoption of the Yarrow flap system and also to the special machinery and beilers with which she is fitted. This consists of two sets of triple-expansion engines of Yarrow & Co.'s standard high-speed design, steam being derived from two Yarrow watertube double ended boilers, this type of boiler being capable of that flexibility which is required in the service for which the Shu-hun is used.

It may be of interest to give the leading dimensions of this steamer which are as follows:—

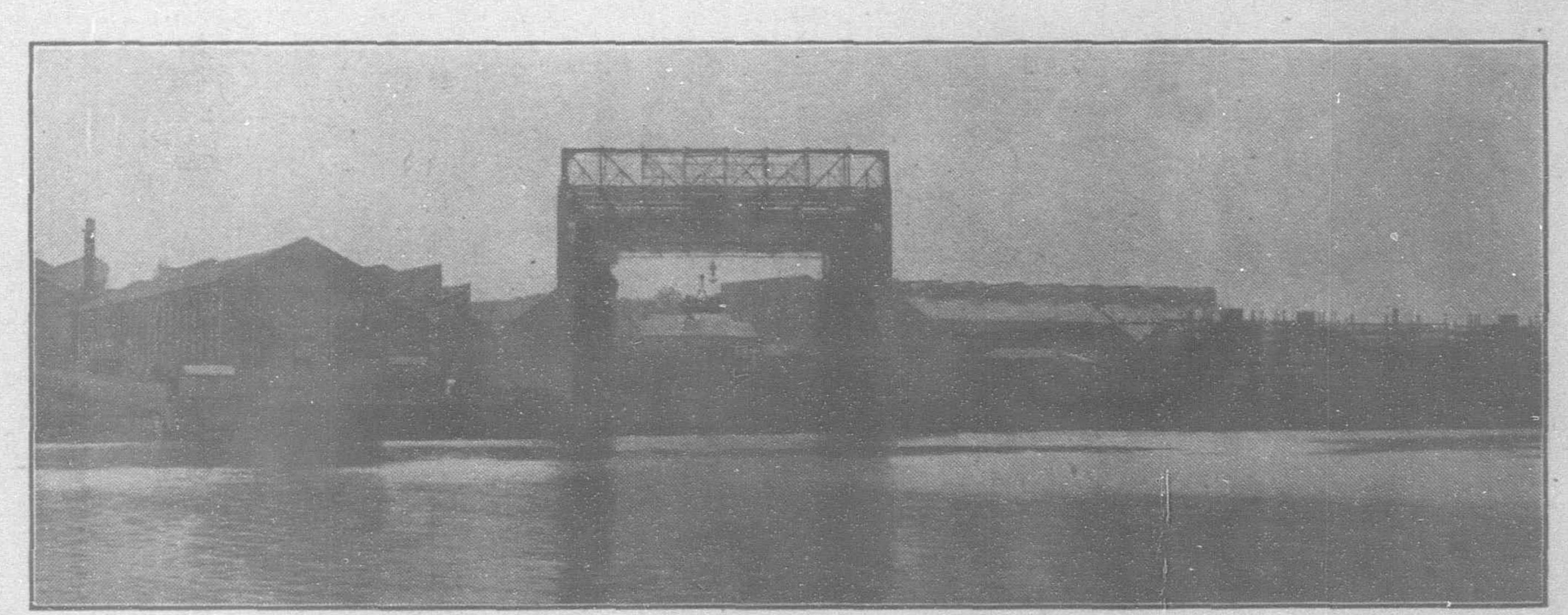
 Length overall
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 ...
 30 feet

 Beam
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 ...
 ...
 9 feet

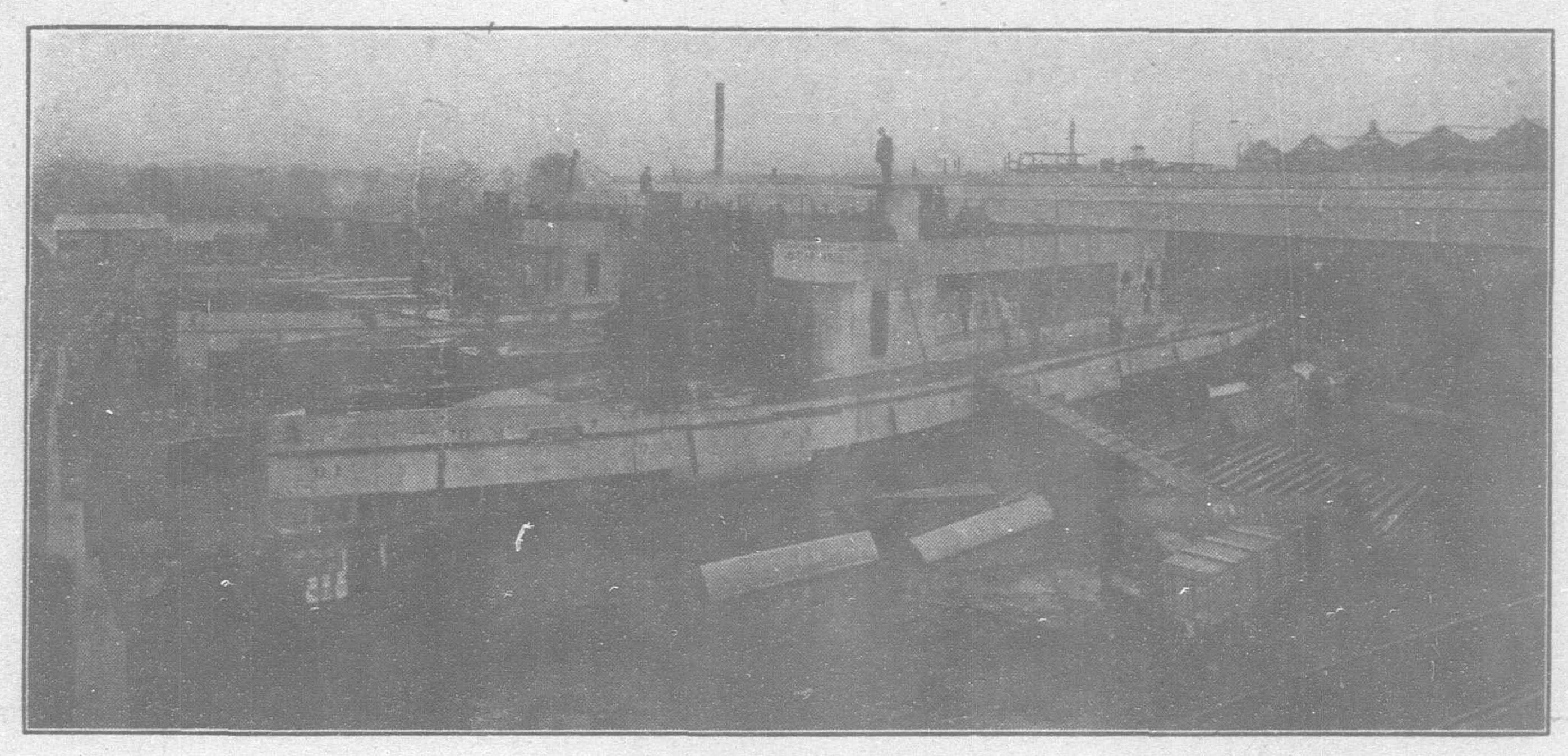
 Depth moulded
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The accommodation for passengers is very extensive and elaborately fitted up. In addition to passengers 300 tons of cargo can be carried on a draft of about 5 feet.

The success of the Shu-hun came fully up to Captain



General View of Messrs. Yarrow & Co.'s Works



Shallow Draft Vessels being Built in Glasgow

Plant's expectations, and she has earned a small fortune for her owners.

As the result of the experience gained with the Shu-hun, Yarrow & Co. have been able to make several improvements and these are being embodied in later vessels of the type which are at present being built at their shipyard on the Clyde, and which will in due course make their appearance on the Yangtze.

Unique Portable Steamers

A very different problem in river navigation presented itself many years ago when H. M. Stanley, the great African explorer, was preparing to make his historic expedition up the Congo into the then unknown regions of Africa. In that case it was known that in the upper reaches of the river there existed numerous cataracts and falls which it was impossible to navigate with any type or size of boat. The builders of the Shu-hun, met this problem by designing and constructing the stern-wheel steamer Le Stanley, which while being of sufficiently shallow draft to navigate most parts of the river was powerful enough to steam at good speed against the stream with the members of the expedition, and a large supply of stores on board. This vessel was construced in separate sections bolted together, each section being provided with wheels. On reaching a cataract each section of the vessel, supported on its wheels, was pulled on to the bank, and hauled by natives the short distance to the next navigable reach of the river, where they were easily reassembled and the voyage continued.

Steamer Carried Over Andes

Another interesting problem which this enterprising firm had to solve was the supplying of a shallow draft steamer to navigate on a shallow lake situated many thousand feet above the sea level, which was connected to the outside world by a precipitious track up which the carting of heavy loads would have been impossible. The vessel was put together in the builders' yard in England, and then taken into such small pieces that each piece could be carried on men's backs. These small packages were taken over the mountains, the Andes, put together on the shores of the lake and the vessel was soon successfully operating on this inaccessible expanse of water.

Usefulness in the War

Large numbers of vessels have been made by Yarrow & Co. on the system described above. The illustration given in our advertisement appearing in this issue, shows the small *Tigris* gunboats of which sixteen were built during the war, and which were very largely instrumental in the capture of Baghdad. The large *Tigris* gunboats were also designed by Yarrow & Co. Both sizes of

gunboats were equipped with the firm's special type of machinery and boilers.

The Up-to-Date Works

The well equipped and up-to-date works of Yarrow & Co. are situated at Glasgow, and a general view taken from the south bank of the river is illustrated on page 11. It will be noted that the fitting-out wet basin is covered in with glass both at the sides and overhead. In the background will be seen the substantial engine and boiler shops which are specially equipped to construct machinery of the type fitted on the Shu-hun.

Our last illustration shows a number of shallow draft vessels being put together in the shipyard at Glasgow.

NEW JAPANESE STEAMERS.—Six steamers, with a combined tonnage of 19,900 tons, were launched at different dockyards during last October. The total number of newly built steamers each of over 1,000 tons since the beginning of the present year has reached seventy-seven with a combined tonnage aggregating 374,705 tons. The names and capacity of those new steamers launched during October are as follow:

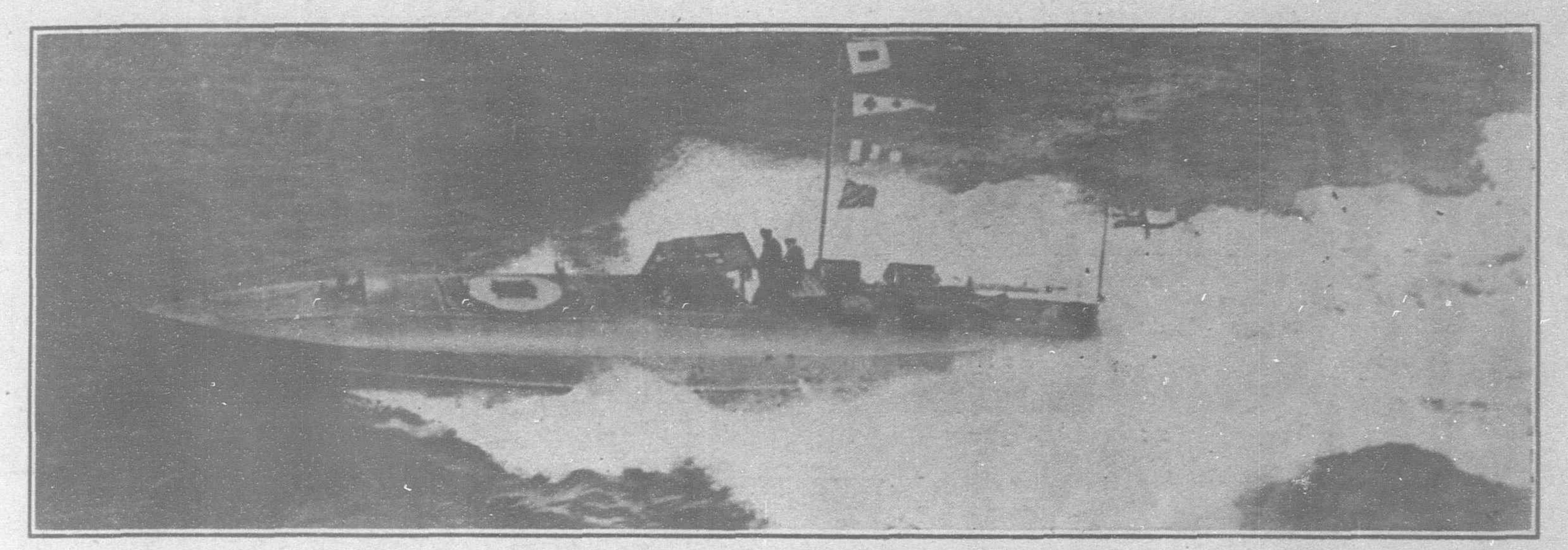
| Names | 100 | Tonn | age | Built | at | To the Order of |
|----------------------------|-----|-------|-----|-------------------|-------------------------------------|-----------------------------|
| Kyozan Maru Kochi Maru | | | | Urga do Harima | THE YEAR WILLIAM TO SERVE THE STORY | Nisshin S.S. Co |
| Hamburg Mari Kishu Maru | U | 5,700 | " | Uchida | dockya | rd Uchida S.S.Co. ks O.S.K. |
| Eikoku Maru Fusan Maru | *** | 4,500 | " | " | 33 | CVI 37 TF |
| Total | | | | | | |

SHIPYARD FOR VLADIVOSTOK.—The Albom and Shostead Company have applied for permission to build a ship-building yard in Diomyd Bay near Vladivostok. Swedish capital will finance the enterprise. The company will undertake the building of ships of medium size. Work will be taken in hand about a year from now, after one of the Company's members has returned from a trip to Sweden.

JAPAN'S FIRST ELECTRIC STEAMER.—The first electrically propelled steamer in Japan was launched on December 24 at the Asano Shipbuilding Yard at Tsurumi. The steamer, Biyo Maru, was ordered by the Toyo Kisen Kaisha, and is 8,800 tons. She is four hundred feet long and fifty-three feet wide. The electric motor develops three thousand horse-power, and the speed will be 15 knots.

Thornycroft Coastal Motor Boats

(C.M.Bs.)



A THORNYCROFT TERROR IN THE NORTH SEA
One of the 55-foot Thornycroft Coastal Motor Torpedo Boats fitted with Y. 12,350 h.p. Motors, Speed 45 to 50 knots.

CONSIDERABLE publicity has been given to the operations of the American submarine boat chasers and motor launches during the war, but the activities of the purely British C.M.Bs. have been kept very secret, their existence being known only to very few outside the British Navy.

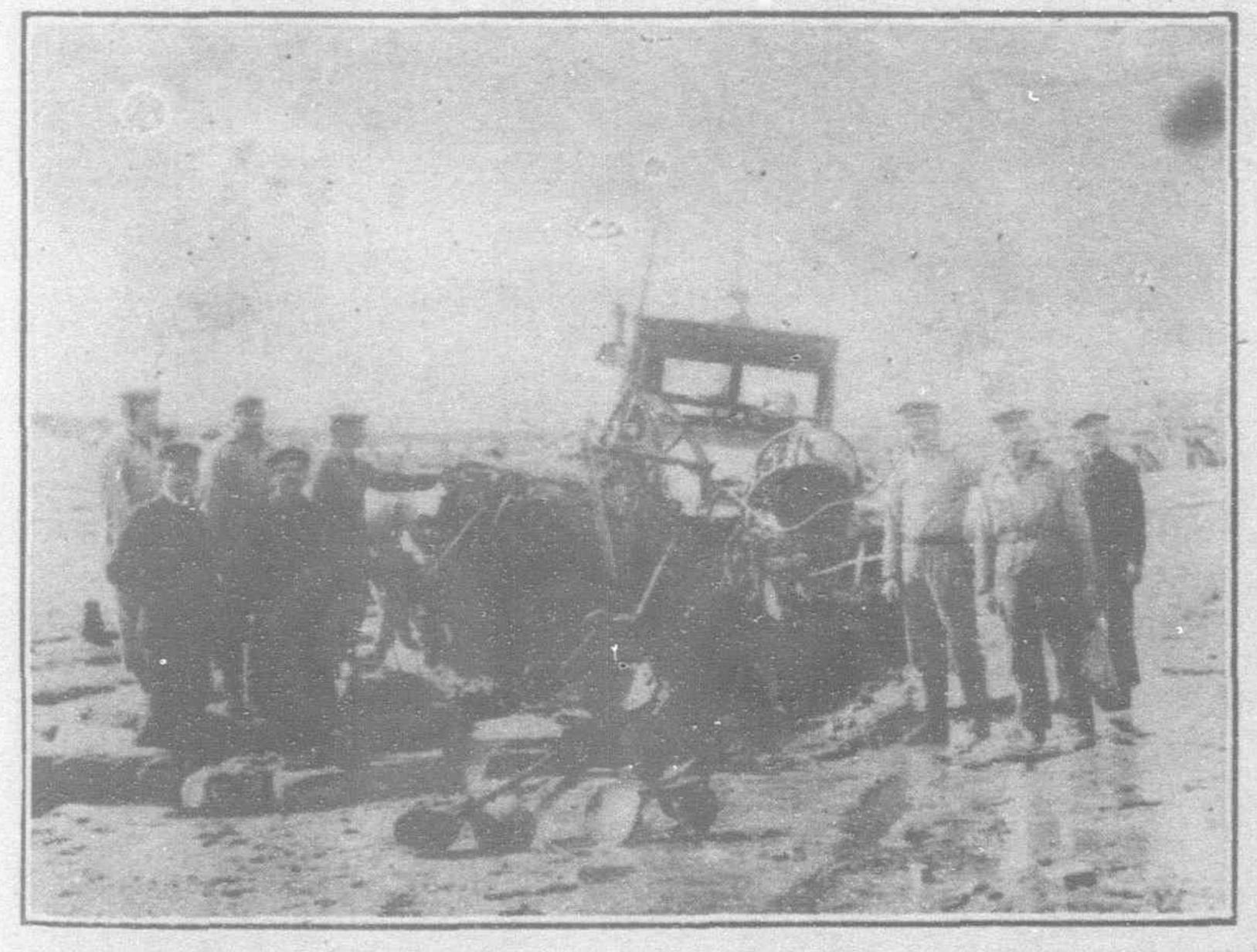
Small high-speed craft in the early days of the modern Navy were looked upon as the right type of vessel to fight with the Whitehead torpedo, but, during the thirty years or so preceding the war, the torpedo boats grew and grew in size until they were really small cruisers, and the fighting which has taken place during the war (except in the case of the Jutland Battle and one or two other instances) showed that their work would mainly be done with their guns.

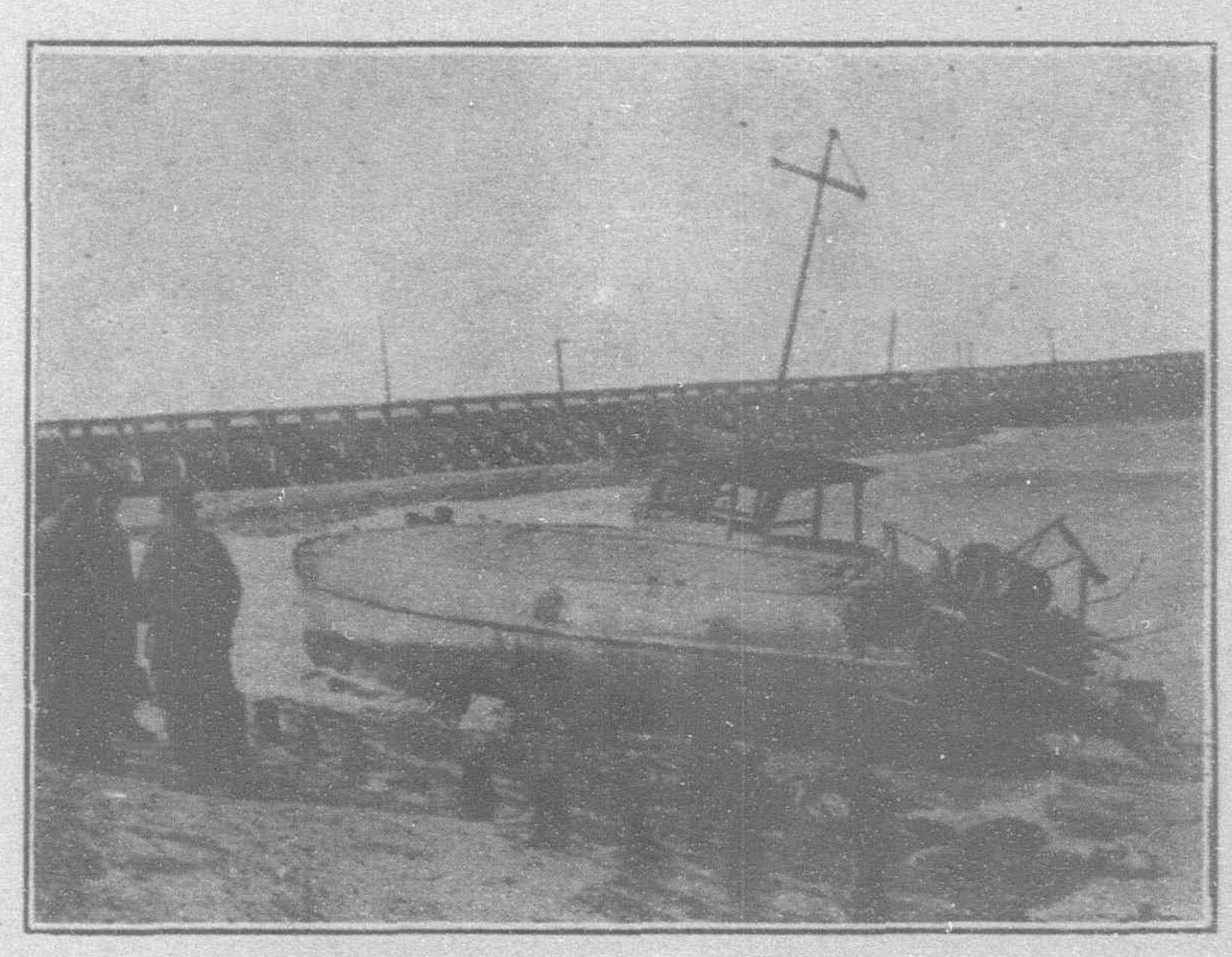
The very extensive use of mines made it extremely difficult for submarines and boats of considerable draft to approach the

enemy bases, with the result that the smallest possible vessel with a great speed was again the obvious means of carrying the Whitehead torpedo to attack the enemy.

The first torpedo boat in the British Navy, built in the early 'seventies, was a Thornycroft boat, and large numbers of similar small craft were built for all parts of the world. With the development of the internal combustion motor, this firm designed and built a 40-ft. motor torpedo boat for the Russian government during the Russo-Japanese War. During the ten years or so before the war a special form of hull was developed which was the outcome of many years' experiment by Sir John I. Thornycroft, F.R.S., and Mr. Tem Thornycroft. This hull would not only skim on the surface of the water when driven at high speed, but also had good sea-going qualities.

In the early summer of 1915 designs were prepared showing





THE "LITTLE FELLOW" THAT STAYED IN OSTEND

Two C.M.Bs. entered Zeebrugge Harbor in the early stages of the operation to torpedo a vessel alongside the Mole, while others were fitted with trench mortars to throw bombs over the Mole on to the aeroplane sheds. In the second action at Ostend when the Vindictive was placed in position, two C.M.Bs. were told off to torpedo the ends of the piers to put the guns on them out of action. While others made the smoke screen, one of them went in ahead of the Vindictive burning flares to indicate the exact position of the entrance. In all these perilous exploits, only one of the "little fellows" remained behind, struck by a direct hit from the batteries at Ostend, and washed ashore where it was taken to Germany for study and "dissection."

this type of boat fitted up for carrying a torpedo in a dropping gear, and submitted to the Admiralty. Shortly afterwards three young officers from the Harwich Force proposed to Thornycrofts to build the smallest possible boat which could carry a torpedo. The weight of the boat complete with this torpedo was not to exceed that of the ordinary 30-ft. motor boats, carried in davits of the light cruisers. A speed of not lees than 30 knots was considered necessary to give the boats any chance of success, and fuel for a considerable radius of action was imperative.

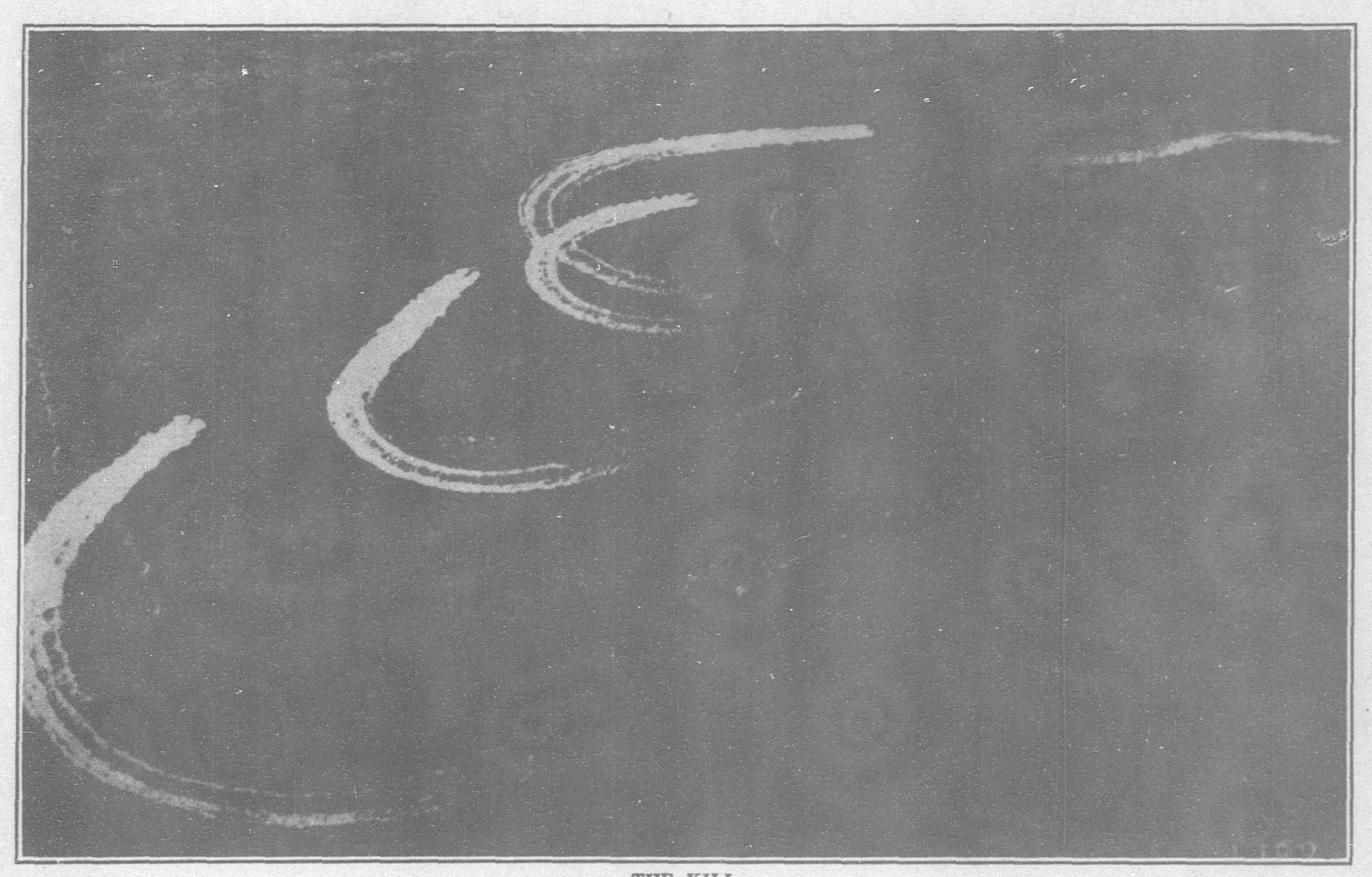
At first sight the conditions seemed very difficult to fulfil, as the high-speed racing boats which had been built had never carried any greater load than the crew, and fuel for a short race. They had never been designed with the necessary lifting gear and stiffening to enable them to be slung in davits with a heavy load.

The torpedo itself amounting to about three-quarters of a ton, the discharge gear and fuel also had to be provided for.

be capable of being discharged as the boat advanced to the attack at high speed.

It was found comparatively easy to arrange a satisfactory means of carrying the torpedo and discharging it over the stern, but this would have necessitated turning for the attack to be made, and it was thought that the chances of success, if this had to be done, would be greatly reduced. Eventually, the happy idea of discharging the torpedo over the stern tail first occurred, it being thought that if the boat were going at about the same speed as the torpedo there would be a good chance of eer being steered clear of the torpedo's track after it had been discharged. It was felt that the success of such a scheme could only be determined by trial, and so an experimental boat was got ready as quickly as possible.

The only boat which was available for experiment was not a very fast one, but, from the trials which were carried out towards the end of the year, the torpedo specialists from the Vernon



THE KILL

This remarkable photograph taken from an aeroplane discloses a "Pack" of British C.M.Bs. that have hounded down their German submarine quarry in the North Sea and dropped their depth bombs. They are seen "Beating It" at top speed and in perfect formation to get outside the danger zone before the explosion.

From the data available concerning boats of the type and from model experiments it was decided the conditions could be met, but the best way of carrying and discharging the torpedo was considered uncertain.

The earliest torpedo boats carried their torpedoes in a dropping gear which has remained a service fitting in picket boats up to the present war; but the dropping gear had never been employed for anything larger than a 14-in. torpedo and necessitated the boat being brought to a very slow speed before the torpedo could be released. In some of the early boats built for the British Navy the torpedoes were carried in a shoot or trough in the bow and discharged by being pushed out by a ram, but the bow discharge had been abandoned for many years as a bad arrangement.

The idea of the officers who were urging the scheme, and who had volunteered to take charge of the boats themselves if they could be obtained, had for their sole object attack and not defence, so it seemed imperative that the torpedo should somehow

decided that there was every chance of it proving successful with a boat having a speed of over 30 knots.

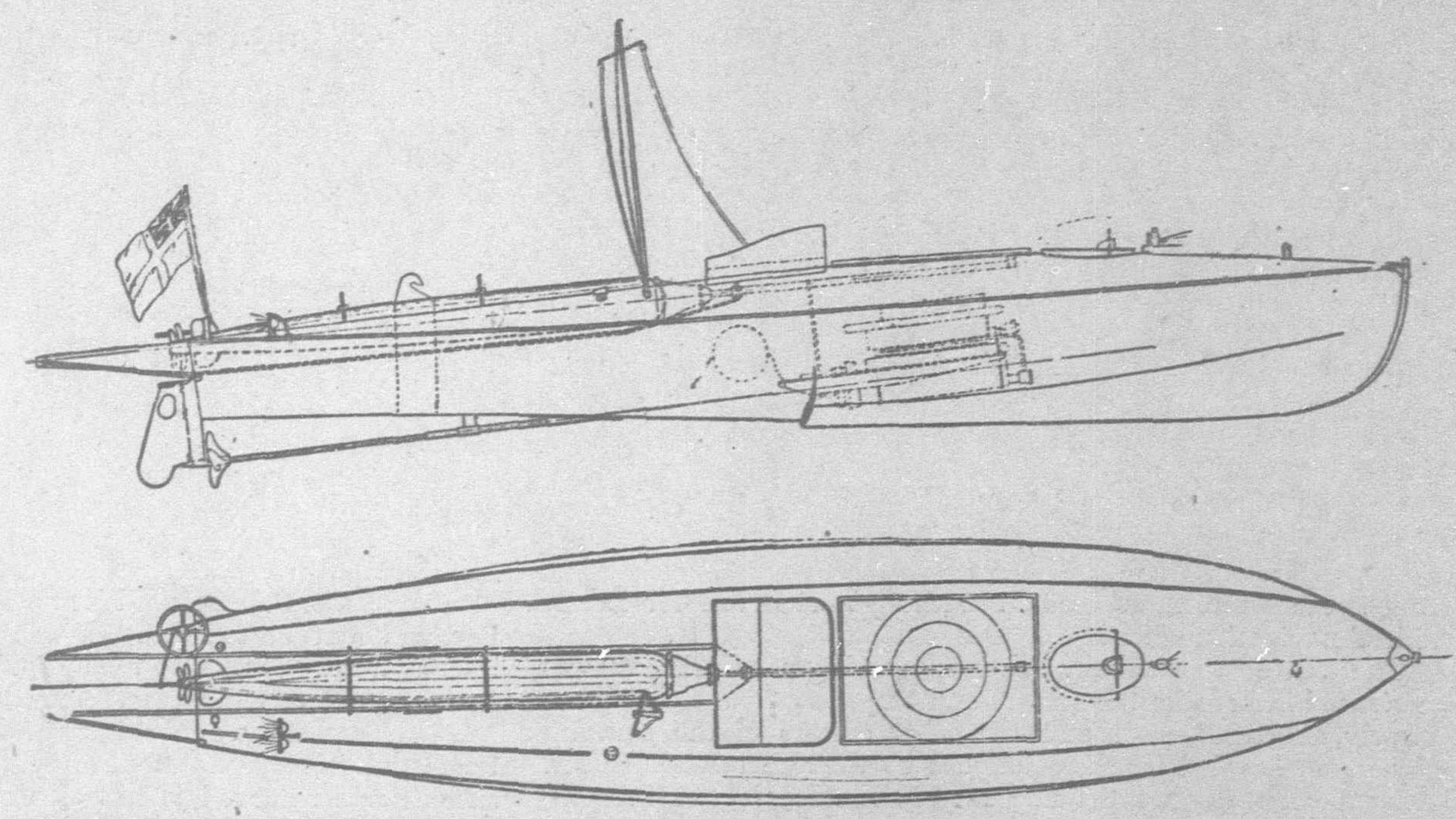
In the meantime, detailed designs of the boat had been prepared, and in January, 1916, after their approval by the Director of Naval Construction, Sir E. H. Tennys in d'Eyncourt, c.B., and the Engineer-in-Chief, the First Sea Lord and Sir Henry Jackson decided that twelve boats should be built.

Thornycrofts were instructed that the greatest possible secrecy was to be maintained, it being considered that successful operations with them would greatly depend on the enemy being ignorant of their existence. Arrangements were made to build the boats on an island in the Thames, a certain number of skilled workmen from the dockyards being loaned to assist in the work. As no motors existed which were suitable, new designs were prepared and the motors put in hand at Thornycroft's Basingstoke Works, where the torpedo gear and fittings were also made. The first three boats were completed in April, 1916, and were inspected by the Sea Lords who considered them successful in every way. As a base, the South-Eastern Railway Company's

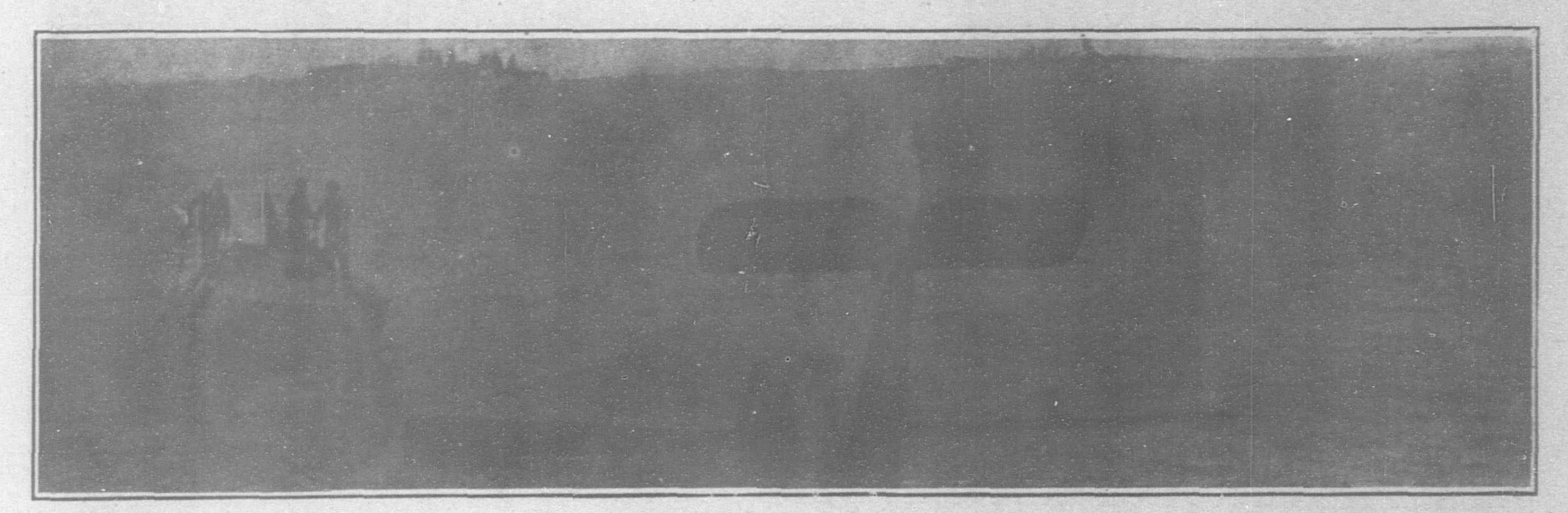
pier at Queenborough had been decided upon and the officers who volunteered for service on these boats for some time lived on the pier, using the station buildings as their living quarters and mess. Even in Sheerness it was not known what the boats were for, their running for training purposes being very largely carried out at night.

It was decided that the crew should only consist of two officers and, with a view to their being thoroughly conversant with the motors, they all spent a month or so at Basingstoke seeing them built and go through their trial.

Very few mechanics with the knowledge of motors of upwards of 250-horsepower, of more or less the

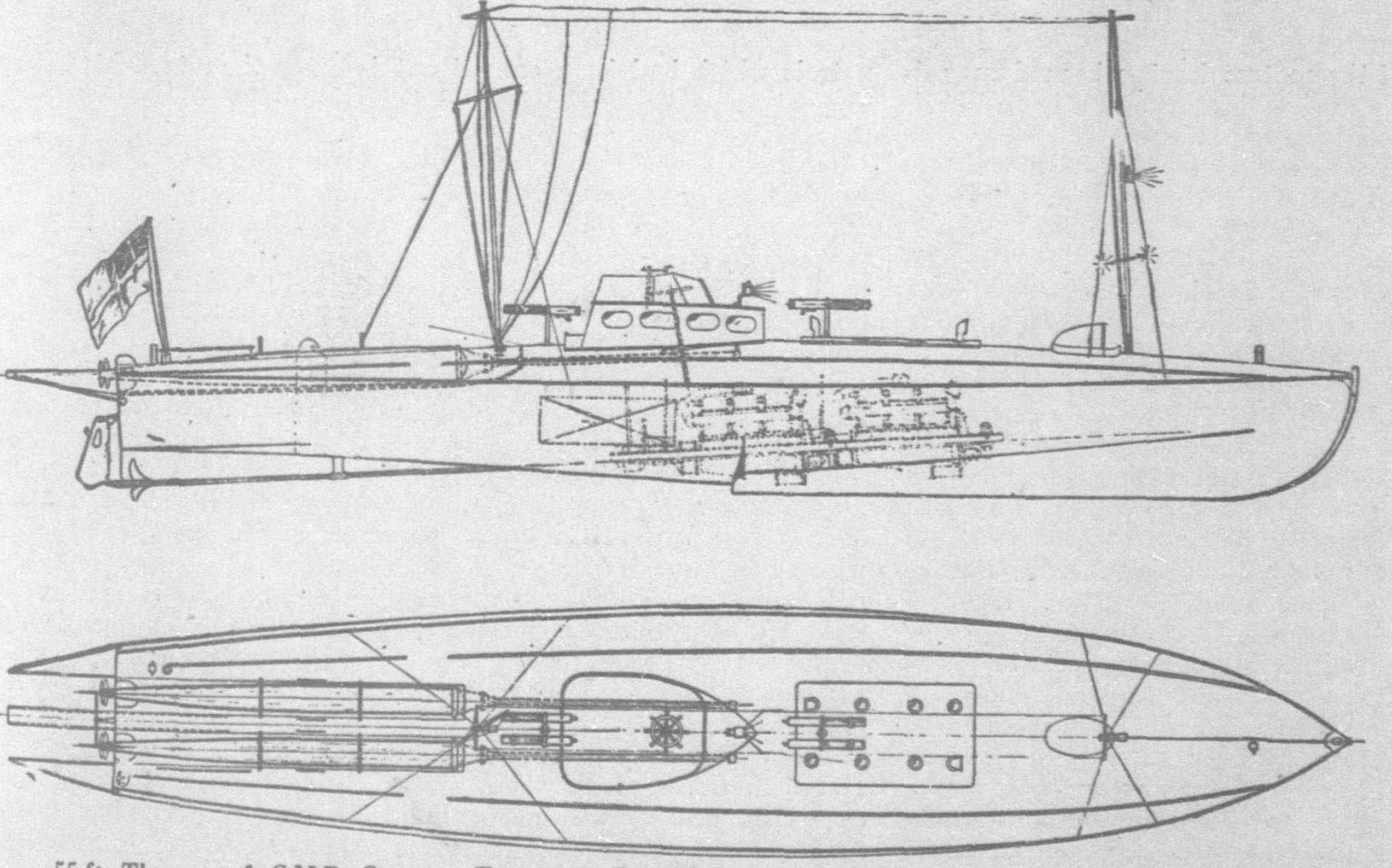


40-ft. Thornycroft C.M.B. Carrying one 18-in. Torpedo as Bailt for the British Admiralty, 1915-1)18



THE C.M.B. ON THE JOB

Rescuing the Crew of an Enemy Plane Brought Down by the Fleet.



55-ft. Thornycroft C.M.B. Carrying Two 18-in. Torpedoes as Built for the British Government 1915-1918

aeroplane type, were available in the country generally, and there were certainly none among the artificer branch of the Navy; so that not only had the officers to get accustomed to handling the boats and firing their torpedoes under novel conditions at speeds well over 30 knots in the dark, but a staff of artificers and mechanics had to be trained to look after and maintain the motors.

There is no doubt, however, that after the few months' practice which they all had together, the officers themselves attending to every detail of the motors and boats, they were worked up to such an efficient stage that it would not have been possible for the motors and boats to have been run better. The captain of the different boats knew their brother officers' methods of handling [and [manceuvring so well that they were able to perform the most complicated operations under Lieut. Hampden's direction at night without

difficulty.

The officers who volunteered to serve were largely recruited from the Harwich Force, and the captains of the boats were nearly all "R.N."-Lieut. Erskine Childers, R.N.V.R., had been persuaded by Capt. Barry-Domville to join as navigator, in view of his exceptional knowledge of the German coast, Lieut. Dayrell-Reed, R.N.R., and Surgeon-Lieut. Anson, R.N., who transferred in order to take charge of a boat. The first published report about C.M.B. operations occurred in an announcement of bombing operations by aircraft at Ostend, the report stating that, as a result of other naval operations, certain destroyers were sunk. Four of the boats had been sent over at the end of the year 1916 to Dunkirk, in readiness for a suitable opportunity. There was no prepared base, so that the boats and their gear were berthed on a large steel barge, on which the officers and crew lived through the winter. A disused bathing-box served for Lieut. Childers' navigation office!

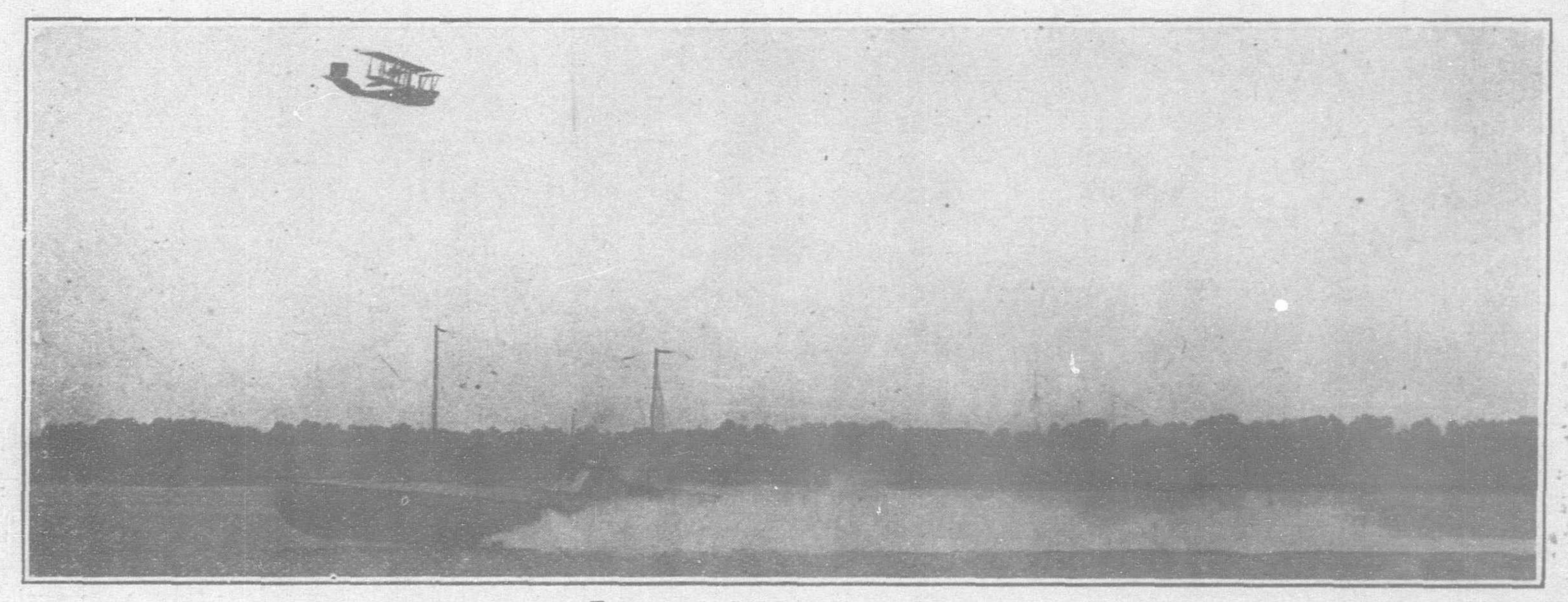
The winter was a very hard one and great difficulty was experienced in keeping the motors and torpedoes from freezing up. However, Lieut. Beckett and the other officers of the Dunkirk party were rewarded for their patience by their successful attacks. During the first few months only one of the officers (Lieut. Anson) was hit by a machine gun bullet, the boats all getting home

new conditions. Greens, Fiats and Sunbeams were all utilized in addition to the special Thornycroft engines. The conditions under which motors have to work in these boats are, undoubtedly, more severe than in any type of aeroplane. and a great deal of work was entailed in adapting them. With the greatly increased number of boats there were not enough R.N. officers who could be spared, and a large number of R.N.R. and R.N.V.R. joined the C.M.B. Service, after the new field of operations had been started by volunteers from the original C.M.B. Section, who did not at the time expect so good a future for these boats elsewhere. The 55-footers, in addition to two officers carried two motor mechanics and a wireless operator. The motor mechanics were drawn from the Hermione, and had been largely recruited from Canada, Australia and New Zealand.

It is quite certain that there is no other motor mechanic's job which is comparable in risk and severity of the work which they

have had to perform.

The 55-ft. C.M.Bs. used for anti-submarine work were based at Portland and Portsmouth, as well as Dover. Dover's advanced base at Dunkirk was also then provided with suitable accommodation for the boats and quarters for the officers. The Dunkirk boats had in addition the opportunity of actions with the German patrol boats and destroyers. Besides being the first base from which a success was achieved it has also shown the greatest amount of running, some tens of thousands of miles having been covered in



Thornycroft C.M.B. Making 50 knots

safely—in spite of vital parts of the motors having been damaged on two or three occasions by enemy action, repairs being effected by the resource and energy of the motor mechanics.

In the meantime, an experimental boat of twice the power designed to carry two torpedoes instead of one was built, and it was considered that this larger type might be valuable to act against the German submarines. Captain Humphrey T. Walwyn. D.S.O., R.N. (of the Anti-Submarine Department) carried out trials with this 55-ft. boat, armed with one torpedo and four depth charges instead of the second torpedo.

As a result of the trial, the Admiralty decided to build a large number of boats with all speed, and Thornycrofts instructed to arrange with firms accustomed to light boatbuilding to build to their designs, and arrangements were made with about a dozen firms, i.e.: Messrs. The Hampton Launch Works, Limited; Messrs. Salter Bros.; Messrs. Tayler & Bates, Ltd.; Messrs. Tom Bunn & Co., Ltd.; Messrs. Frank Maynard; Messrs. J. W. Brooks & Co., Ltd.; The Rowhedge Iron Works; Messrs. Wills & Packham; Messrs. Camper & Nicholsons, Ltd., etc. etc.

So many boatbuilders had left their ordinary work to go to the aeroplane factories that it was most difficult to find men of the right class and, in many of the yards, the boats had to be built with the assistance of men who had had no previous experience in boat-building. The supply of the motors was also a difficulty, and it became necessary to adopt motors of various aeroplane types and to make them as suitable as possible for the patrols which had been carried out between the minefields before the entrances to Zeebrugge and Ostend by the officers who took their turn at the advanced base.

Since it has been possible to obtain information from the Belgians who lived in these places during the German occupation, the Commodore at Dunkirk states that the German naval authorities were in utter dread of them, and never knew when to expect them. Their own motor patrol boats, or "P.M.Bs." as they were called, never ventured out at night or when the weather was the least bit bad.

During their patrols up the coast they were constantly fired at by the shore batteries and, unfortunately, more than one has been lost, having apparently received a direct hit at short range.

One of the most interesting successes was described in the Daily Mail: "Five German destroyers, returning from their dash through the Straits, encountered small high-speed craft, which succeeded in torpedoing one or more of them," but the newspaper account did not tell how one of the officers—in the haze—went so close to make his attack that the blast from one of the destroyers' 4·1-inch guns which they fired at him actually blew his cap off his head without damage to the boat or injury to himself.

For North Sea work a new base was established not far from Harwich, the particular spot chosen being considered admirably suited for a first-class shore establishment, with every facility for maintaining the boats in the best of order. Residents in Harwich and Felixstowe have been familiar with light cruisers putting out to sea with a couple of 40-ft. C.M.Bs. hanging from their davits. The quickness with which these boats can work up to their speed, which is more than the majority of destroyers in favourable weather conditions, has enabled them to get away from Germans successfully after attacks; but, the aeroplane or seaplane having greater speed has, as was expected, proved a formidable adversary when met with in the daylight, and it will be recalled that in the summer of this year six boats were reported as lost after a hostile aeroplane attack. Fortunately, they were not all lost, and four of them were able to make their way into Holland, but not until they had accounted for several of the planes which had attacked them in very great numbers and had used up all the ammunition for their Lewis guns.

In previous actions the C.M.B. officers had had to defend themselves against aeroplane attack, and the boats and officers had been hit on numerous occasions. The new tactics of the enemy, attacking even destroyers with large numbers of planes at once, obviously put them in a very difficult position.

There have been many cases of splendid pluck and heroism in the numerous fights which the C.M.Bs. have had, and in this particular North Sea action, after the boats had all been riddled and most of the officers hit, Lieut. Lewis—who was wounded himself succeeded in keeping another officer afloat on a large fender for

over two hours and saving his life.

The blocking actions at Zeebrugge and Ostend have been very fully described as far as the larger vessels are concerned, and the official reports made reference to the good work done by the C.M.Bs., but it is not generally known what a leading part the C.M.Bs. played, and that many of the officers who were given decorations were in charge of them! In the Zeebrugge action the C.M.Bs. were responsible for not only making the smoke screen (which they effected by running ahead of the other vessels at high speed and emitting smoke clouds from their exhaust, by a special smoke-producing contrivance), but had to mark certain positions with flares to indicate the right turning points for the blocking vessels. Two C.M.Bs. entered the harbor in the early stages of the operation to torpedo a vessel alongside the Mole, while others were specially fitted with Stokes trench mortars to throw bombs over the Mole on to the aeroplane sheds.

In the second action at Ostend, when the Vindictive was placed in position, two of the C.M.Bs. were specially told off to torpedo the ends of the piers to put the guns on them out of action. While others made the smoke screen one of them went in ahead of the Vindictive burning flares to indicate the exact

position of the entrance.

Admiral Keyes, in his official report of the blocking actions, referred to the highly efficient handling of his boats by Lieut. Welman, R.N., the officer in charge of them and the Dover Base. Their high speed and small size may, to some extent, be a source of safety, but there is no question that the duties which they have undertaken have made the service one of the most risky in the Navy.

It is a remarkable fact that, with one exception, all the C.M.Bs. which took part in the blocking actions succeeded in getting away—although they were, in many cases, very battered and war-

worn, with numerous officers and men wounded.

Mine-laying hardly sounds the work which would be expected for these small craft to undertake, but they have been used very effectively to lay mines where the ordinary mine-laying vessels could not go, their shallow draft enabling them to pass safely over enemy minefields and their high speed to approach unexpectedly enemy waters.

It is not possible to give an account of all the operations and actions these boats have been in and the gallant deeds of their officers and crews, but the list of officers who have received the D.S.O., D.C.M., and other honors, gives the best possible indication of the opinion of the Admiralty concerning the part they have played in the part I were!

have played in the naval war!

Unhappily, a number of officers and men have lost their lives and have been badly wounded, but, considering the risks they have run, the percentage has not been unduly great—probably not more than in the Air Service.

Reference has already been made to the difficulties involved in building up a fleet of this special type of boat, after the labor

and material in the country had been so thoroughly appropriated to aeroplane building and other classes of work which were given the highest priority.

Some reference to the work of the men who built the boats, motors and ran the trials is due. They necessarily knew, in the early stages, the details of the boats and had a good idea of the work which they were intended to do. They kept the information to themselves and put their best possible efforts into their work. Coming in contact, as they did, with the officers who were going to fight with the boats gave them additional interest in building them as well and as quickly as possible.

In this short history it is not proposed to go into details of design and construction. It has been pointed out that there were necessarily many problems to meet the very special conditions. The various devices which had been adopted in the old steamtorpedo boats could not be applied without modifying them to suit the new conditions, and it may be safely said that every detail in the boats, from the torpedo director to the keel, had to be specially worked out afresh.

While the designers and builders alike take a pride in their production, they are all agreed that however good the boats may be the successes which have been obtained with them are due to the British Navy officers concerned and, without their skill and endurance, the boats would have done nothing.

The Japanese Shipbuilding Industry

Profits Decreasing: Future Not Bright

The Japanese shipbuilding industry is now badly off due to difficulty in getting a supply of materials keeping the cost of construction higher than that in England and America and also to the decrease in the demand for ships since the end of the war. The dockyards which sprang up or were extended in countless numbers during the war, have long been feeling the effect of the slump; many dockyards were closed shortly after the restoration of peace. The American orders for Japanese ships in exchange for American iron, which kept the Japanese dockyards fairly busy, have been completed. The demand for ships in Japan has decreased considerably of late due to an unprecedented crisis in Japanese shipping circles. Some dockyards, though desirous of effecting liquidation, cannot do so owing to lack of funds for the purpose. The larger dockyards are also feeling the effect of bad times. Soon after the armistice, the dockyards capable of constructing steel ships of 1,000 tons over (gross) in Japan numbered 45, with 135 slips, these have decreased by more than 50 per cent. The situation is expected to become still worse in view of the gradual decrease in the demand for ships. Old contracts have almost all been fulfilled and the dockyards are anxiously awaiting new orders, expected to come after the present crisis. Except a few dockyards having special connections with the Naval Department, there is little work for the next year. Orders from the Naval Department in connection with the eight-eight squadron scheme will not suffice to keep these yards going. There are at present no transactions in the selling and buying of ships. The Osaka Ironworks, one of the leading dockyards in Japan, is an exception. It is comparatively well off due to the non-speculative policy it adopted during the war boom.

The following figures indicate the financial positions of the leading dockyards in Japan:—

| leading dockyards in | oapan. | |
|----------------------|------------------|--|
| Names of Dockyards. | Paid-up Capital. | Reserve and Sum Brought Forward (from first half 1920) |
| Kawasaki | 26,520,000 | 29,349,000 |
| Osaka Ironworks | 10,500,000 | 9,012,000 |
| Ishikawajima | 3,520,000 | 3,440,000 |
| Uraga | | 2,847,000 |
| Yokohama | | 2,167,000 |
| | | |

As regards the profits earned during the first half of this year, they averaged Y.88.50 per ton, but the profits for the second half of this year are expected to show a great decrease. They are estimated at about Y.71 per ton.

The Far Eastern Review

A Monthly Review of Far Eastern Trade, Finance and Engineering, Dedicated to the Industrial Development and Advancement of Trade in Far Eastern Countries

ENGINEERING

FINANCE

COMMERCE

5 JINKEE ROAD, SHANGHAI, CHINA

Telegraphic Address: Farview, Shanghai

SHANGHAI, JANUARY, 1921.

RESERVED RES

Lest we Forget!

"It wants more courage to make peace than to carry on a war. People who demand war and criticize peace are generally weak people who have never fought."

ELIHU ROOT, the foremost American statesman of our time.

The Consortium is Honest

OR the benefit of some of its Chinese critics, it may be no harm to say that one thing is certain about the motive back of the new consortium. It is an honest motive. No sensible person criticizes its honesty.

For that reason, among others, the American group is to be congratulated upon the choice of Mr. Frederick W. Stevens as its Peking representative. Mr. Stevens has been cast for a big job. He has the three chief essential requisites for success—honesty, intelligence, friendliness. The impression he made upon his naturally critical (albeit very friendly) first Chinese audience was one of plain-as-day honesty. Excellent! He can build on that. The virtue most highly prized in Asia is honesty.

His first speech at Shanghai was matter of fact, simple, to the point. He left oratory to the "orators." That was very good. We have a super-abundance of florescent flubdub, and facts simply stated are ever welcome. He told us three things, very honestly and very sensibly: The first Consortium loan must command the confidence of American bond-buyers as well as Chinese borrowers; the security, therefore, must be ample; and there must be no alienation of Chinese rights through "concessions."

We suggest to this pleasantly efficient plain person from Ann Arbor that he will do well to be a good listener in Peking; and, to the Chinese who love their country and seek to serve her interests, we would say: "Tell your troubles to Mr. Stevens. If be can help you, we believe that he will. But—and this is very important—don't try to 'put anything over.' It wont go, or we miss our guess. That Scotch-Michigan mixture is tough stuff, good to lean upon and fool-proof."

Coal Utilized as War-Making Fuel

Led by the representative spokesman for American newspaper-dom—the able and enterprising Editor and Publisher—newspapers and periodicals of the United States and Canada have united in efforts to slay the serpents of propaganda. Some good work has been done, but one field has still been left untouched by Brother Brown of the World Building—Far Eastern war-making propaganda. Here are two illustrations culled from the last

batch of home clippings, both mined out of the same material, Chinese coal shipments to Europe:—

From the Saturday Evening Post:

"Events of world-wide importance sometimes take place without attracting attention at the moment. The delivery of a hundred thousand tons of Chinese coal at Marseilles received no comment from the American press. Failing to procure sufficient coal from Great Britain or Germany, the Danish state railways have contracted for ten thousand tons of Chinese coal. This is an event of first-grade importance and represents a marked advance in the industrialization of China.

"China lacks railway transportation, of course. To what extent her mines are adapted to machine operation is not yet known. But it is clear that with rising costs of operation and falling output per man in Europe and North America the Chinese coal mines, with the cheap labor at their disposal, will soon become an active factor in the export coal trade of the world. The mines are largely under operation or control of Japanese. Shipping is in Japanese bottoms, which introduces another factor into the situation. Certainly China may be expected to supplant Australia and British Columbia in the markets of our Pacific States. Replacement of British coal by Chinese coal in South America would exert the most profound influence upon the manufacture and trade of the British Empire.

"At the bottom of the coal difficulties of the United Kingdom is an understanding between the British and the German coal miners with respect to wages, output and living conditions. If the Chinese miner is left out of the calculation, he may spring a surprise upon the British and German miners. Coal is such an important factor in the routing of trade over the world that the appearance of a new source of supply is bound to evert for reaching influences."

is bound to exert far-reaching influences."

From the Wheeling (W. Va.) Intelligencer:

"Chinese coal has been received in considerable quantities by Marseilles, France, and Denmark has contracted for a supply sufficient to protect Danish industry through the winter. Coal is mined in China under concessions granted to Japanese operators, and its appearance in the European market indicates the first possibilities of considerable competition for the European coal supply. China is reported to have coal deposits far greater than all of Europe combined, and under efficient direction the Chinese mines can provide a very large supply, both for Japan, for the Pacific coast of the United States, and for Europe.

"The Chinese mines have been operated in a crude manner, and it is estimated that their production has amounted to about 120 tons per man per year. The production of the American mines, with improved machinery, has averaged close to 1,000 tons per man. It is not to be expected, therefore, that even China's cheap labor will result in the production of a large amount of cheap coal, but improved appliances may come to be used in the Chinese mines and with the enormous labor supply in that country, Chinese coal may become an important factor

in the world market."

The Saturday Evening Post is a power for good in the homeland. It is more widely read than any other publication. It has a fine record for courageous and wholesome expression of Far Eastern truths. Editor Lorimer and Mr. Sam Blythe have "spilled the beans" to good purpose on more than one notable American-Asiatic occasion. "The Flying Wedge" won deserved international celebrity. We feel quite sure that our Philadelphia and Wheeling contemporaries will appreciate some facts showing how, despite their knowledge and care, the unscrupulous anti-Japanese press agents have hoaxed them in this matter of the Chinese "sending coals to Newcastle." The great national homeside weekly and the go-ahead West Virginian newspaper would not willingly print untruths. That they were caught off their guard is merely proof of the cunning conspiracy that is at work to make mischief between America and Japan, for anti-American purposes.

The shipping of Chinese coal to Europe is due to (1) the reduced available European output; (2) the cheapness of Chinese coolie labor and increased wage demands of European labor; and (3) available tonnage and attractive freight rates. Foreign firms in China (including American steamship owners) rushed to take advantage of this chance to capitalize Chinese coal and China's cheap millions. The Scandinavians were the first buyers and the chief pacemakers at Shanghai were a European and an American firm. The Japanese entered the competition. It became general and was food for much Shanghai gossip during the summer monthsespecially while the British mining troubles were piling coals of sorrow upon the much-distressed head of Premier George. The assumption that the Japanese monopolized the traffic is vicious and childish larryfarrel. They were in no position to do so. There was a wide excess of available tonnage; so much so that the July number of the British Chamber of Commerce Journal-the official organ of the British chambers of Hongkong and China-summed up the

shipping situation, while the coal boom was on, as follows:-

"Even coal charters, on which owners could almost always fall back upon in the absence of better employment, are difficult to obtain at anything like remunerative rates."

The assertion that Japanese control the mines of China is what might be called a "hardy annual." That it is utterly false is well known throughout the Far East; but it is just as well to clarify the minds of American editors who cannot be expected to know the ins and outs of Chinese industry. The following table gives the facts regarding the ownership and operation of Chinese coal mines:—

| coal mines | | | | | |
|---|--|-----------|------------|--|--------------------------------------|
| Name of Company | Nation | ality | Location | Output ton | s Quality |
| (Mines under Foreign Cont | trol) | | | | |
| Pekin Syndicate, Ltd. | | | Honan | | Anthracite (Anthracite |
| Shantung Railway | | | | 700,000 | and Bituminous |
| Fushun Colliery \ S.M. Yentai Colliery \ Ry. | 22 | | Manchuria | 3,300,000 | Bituminous |
| Lincheng Mines | Belgian | | Chihli | 200,000 | " |
| | To | tal | | 5,000,000 | |
| (Mines under Chinese and | Hornian | Managa | son port) | | |
| Kailan Mining Ad- | | ux wrouge | mocreej | | |
| | AND THE RESIDENCE OF THE PARTY | itioh | Chihli | 4,500,000 | |
| | | | | 90,000 | 99 |
| | | | Manahumia | | >3 |
| Pensihu Mines | | hanese | Manchuria | | . 59 |
| Niusintai Mines | | | 99 | 80,000 | 29 |
| Hsinchiu Mines | 99 | | 99 | 80,000 | 59 |
| | To | tal | | 5,190,000 | ,,, |
| (Mines under Chinese Con | CONTROL MANAGEMENT OF THE PARTY | | | | |
| *Ihsien Mining Adm | | | Shantung | 600,000 | ** |
| Chinghsing Mining Ad | | | | 300,000 | 23 |
| | | | | | Anthracito |
| Paochin | 53 | | Shansi | 800,000 | and |
| | | | | | Bituminous |
| Tsechow ,, ,, | 99 | | | 120,000 | Anthracite |
| Tatung Mines | | *** *** | 59 *** | 190 000 | Bituminous |
| Pinghsiang Mines | | *** *** | TZ: | 900,000 | *** |
| | | | | | (Anthracite |
| Poshan Mines | | | Shantung | 250,000 | |
| | | | | | Bituminous |
| Linhokow Mines | . ,, | | Honan | 200,000 | |
| Chinchow ,, | | *** *** | Chihli | 40,000 | |
| Hsintai ,, | | | Shantung | | |
| Ichow ,, | | | | 20,000 | |
| Chiachiawan Mines | | | 771 | | 19 [[[] [] [] [] [] [] [] [|
| Tanshanwan ,, | | | | | |
| | | | | | *** |
| | To | tal | *** *** ** | 3.486,000 | |
| Total by Fore | | | | I I TOTAL TO A SECURIT AND THE SECURITY OF THE | |
| Mined by Nat | | | | | |
| | | | | | |
| | | | | | |

Grand Total16,676,000 tons These facts clearly demonstrate that it was not possible for the Japanese to monopolize either the mining or the shipping of Chinese coal; and we have gone to the trouble of presenting them primarily in order to warn the American editor that it is well to examine anti-Japanese "free" press matter with an eye wideopen for rather more than the average propagandist tendency to deceive. The agents of Trotsky are very busy just now at Shanghai and in New York; their names are well known to American officials; and one of their chief "poisoned darts" is the iterated insinuation that "Japan plans to flood the world with cheap Chinese cooliemade goods." No, Brother Brown and Brother Lorimer and our wide-awake Wheeling friend! They are flag-waving, so-called Americans who have that "get-rich-quick" idea planted solidly in the back of their heads—the same long-nosed gentry who are to be found at all angles of this war-making in the Pacific, the authors and purveyors of this and other libels levelled at Japan.

Chinese National Assembly will Repudiate Peking Loans

A CCORDING to the Canton Times, the organ of the southern Chinese government, the members of the national parliament now in the Kwangtung capital recently convened and pro-

tested against giving the land-tax as security for foreign loans. The protest says that "the fundamental law of the Chinese republic forbids the government from contracting public loans or increasing the burden of the people without the consent of the national assembly. It is the intention of the national assembly to repudiate all such loans contracted by Peking."

American Economist Consul

R. Frederic Lee, the new American economist consul for the IVI Far East, will have his headquaters in Shanghai at the American consulate. This does not at all mean that his entire time will be spent in Shanghai, as he will travel through all parts of China, studying economic conditions and visiting the consulates in other cities. Mr. Lee spent two years in Japan several years ago, at which time he was a professor of economies in the Sei Gakuin College in Tokyo and he has since held an office in the State Department at Washington, where he handled economic problems in the Far East. Mr. Lee is especially interested in economic conditions in Japan, Manchuria and Eastern Siberia. He will deal with trade promotion only indirectly as his work will be of broader scope and will involve primarily such things as harbor improvements, the development of the cotton-spinning industry, and the financial situation. Mr. Lee received his doctor's degree in economies at Yale University and he also did graduate work at Harvard.

British Training for Chinese Students

TV/E are glad to see that interest in the movement for providing W training in British workshops, laboratories and technical institutions for engineering students from overseas does not weaken. Quite the reverse. It is not very clearly realized that students trained in Great Britain become permanently influenced in favor of British machines and British methods. The instance recently cited of the engineering and shipbuilding works promoted some time back at Canton by a student returned from the United States, who placed orders for the machinery and equipment with the States, is being given wide publicity amongst engineering circles in Great Britain. The Trade and Industry Committee of the Royal Colonial Institute in London has initiated and is carrying out a scheme for providing training for students from British Possessions. The British Eugineers' Association has similar work in hand, as also has the British Electrical and Allied Manufacturers' Association, endeavors in both the last-named schemes not being limited to any particular territory. All such plans, moreover, have the hearty support of the Federation of British Industries. It is understood that the British government has proposals under consideration for devoting the Boxer indemnity to defraying the expenses of the technical education of Chinese students in the United Kingdom. Manufacturers in Great Britain are coming forward and co-operating. The practical assistance of British interests abroad may be safely counted upon, but in this respect a good deal more might be done. The position is distinctly favorable for giving British training to foreign students. The extent to which these facilities are used will depend not a little on the manner in which they are brought to the notice of students abroad. In doing this the aid is solicited of official, engineering and commercial circles in the Far East.—Engineering.

Commercial Morality

A FAVORITE pursuit of the anti-Japanese writer is to attack the honesty of Japanesé business methods. For example, there is that story of the British house in the Straits Settlements that ordered a supply of lead pencils during the war. According to the anti-Japanese story-teller, when the pencils were

^{*} American capital is reported to be interested in this property.

received and after most of the stock was sold "it was discovered that the crafty Japanese had conserved their store of raw materials by merely inserting small pieces of lead at each end of the wooden sticks. When complaint was made that the pencils were not in accordance with sample, the—— (a famous Japanese exporting house) wrote back suggesting that the purchaser had better examine the sample. That was done when, lo and behold, the Japanese rejeinder was proved correct. The sample, also, was minus lead in the middle!"

Now, that might be a very good story for an after-dinner guest of the Modern and Questionable Society of Jolly Jap-Slappers. How about the morality of such slanders? How about the intelligence of the good people who retail and believe such nonsense?

When we heard this story coupled with the name of a Japanese firm that is one of the strongest and most successful in the world, we invited the thought of the narrator to these two pertinent questions. Success is never won along dishonest lines.

American manufacturers, American traders had to learn that lesson. Some of us are old enough to remember the international jest about "those Yankee wooden nutmegs." We are not yet out of the wood and the time has not come for shouting; still we have learned a thing or two, and so have all the others. We have all learned from the English the wholesome truth, "Honesty is the best policy." Upon that sound foundation, the vast commerce of England has been built.

When Harry of Monmouth stood with his little army before the gates of Harfleur, the merchants of England were known throughout Europe as men of their word. "All wool and a yard wide" gave England control of the cloth trade. The tradition of British mercantile honesty walked with knight and squire and archer and man-at-arms in the "White Company" from battle into business. "Value for value received." The guilds of London, the merchant princes that laid the foundations for our present-day chambers of commerce prided themselves chiefly upon their probity and the fine quality of their wares. And well may England look the world in the face, to-day, and say to all: "It is made in England." That still goes. It means much to an empire radiating over the earth from a tiny group of "tight little, right little islands." It has meant much to the real progress of the world.

We were young and careless, and often the name of American business has been soiled by people who were Americans in name only. "Embalmed beef" was sold to our soldiers during the Spanish and Philippine wars and not so long ago we saw a father and son sitting in front of a military court in the homeland, blandly admitting that they had bribed a quartermaster-captain of their own race to unload upon Pershing's army "rainproof" coats as porous almost as muslin. Then, there were those blankets of shoddy that cost so many gallant boys their lives. "If Cleopatra's nose had been an inch shorter," we recall, "the history of the world would have been changed." Most of the stories of Japanese "dishonesty" emanate from gentry whose noses are more noted for length than their race is noted for commercial morality.

All nations have to learn that honesty is the only sound foundation of permanent business. "Character," said the late J. P. Morgan, "is the basis of credit." It is. When the British market was flooded with cheap German goods, the home manufacturers of Britain coined the phrase, "cheap and nasty." It stuck. Home manufactured goods were preferred, not just because they were made in Merrie England but because they were better than the German imitations. The great trade of France in luxuries was built upon quality. "They do these things so much better in France." The stuff was good. It held the markets that it won.

A few years ago, the Japanese houses engaged in foreign trade could be counted on the fingers of one hand. They were pioneers. That they have become among the greatest trading firms on earth is (to any business man) proof positive that they have been conducted along honest and dignified lines. "Up like a rocket and down like a stick." China knows some foreign trading concerns to which that old saw applies. "In with a brass band and a flourish of trumpets and out with the bailiff, unsung

but not unwept." We know one or two like that. That cannot be said of any of the Japanese trading houses.

As others had to learn the great English lesson of honesty in business, so has it been with the Japanese. While the old princely houses of Nippon may well pride themselves upon their fine record, among the younger and less experienced firms there was a disposition to turn a quick penny without enough heed of the future. We hold no brief for the commercial morality of Asia. It has, we fear, quite a long way to go before it will catch up with the spirit of the Middlesex mercers. It will do that, doubtless, in time. China, for example, has queer notions of business morality. The Chinese, bless their hearts, have deluded a large part of the world into believing that Diogenes and his dog and his lamp wasted a whole lot of time looking for the honest man when they might have trapezed over to Cook's and bought a ticket for friend Putnam Weale's "City of the Wonderful Lamp." Apparently, some of our home papers are now sustaining the shock of their lives. A great Shanghai department store has just been blacklisted for infringing a well-known American patented garment and other such things have got into print. No, the Japanese have done nothing to earn the Nobel prize as the premier trade fakirs of earth. The honor-such as it is-belongs to another race, as its finest-members honestly confess. "Be honest; for to be honest as this world goes is to be one man picked out of ten thousand."

Off with the Old Love

IN 1912, certain prominent French and British capitalists combined with high officials of the Chinese government to form an industrial bank in which the Chinese were allocated one-third of the shares. The result was the organization of the Banque Industrielle de Chine under a French charter. Within a short time after it started business, this bank signed a contract with the Chinese government to raise a loan of 150,000,000 francs for the construction of the Pukow Harbor, erection of a bridge over the Yangtze river at Hankow and development of the public utilities of Peking. Chief among these Peking public utilities was the building of the tramways. As security for the loan, the Chinese government set aside the Wine and Tohacco taxes. Soon afterwards, the bank obtained a contract for the construction of the Chinchow (Yamchow)-Yunnan-Chungking railway, carrying with it a loan of 600,000,000 francs. Within a year, the new institution had obtained some of the choicest concessions in China in partnership with the high officials then running the government. An ideal business arrangement!

During the war, when the Peking government was, hard up for funds and the French bank could not place Chinese securities in the French market, monopolized by French needs, the Chinese obtained funds from Americans and handed over the security originally set aside for the French bank. This called forth an immediate protest from the French minister. Nevertheless, the American loan went through, despite the French protest. Another few years have passed. France is staggering under its war debts. The investing centre of the world has shifted from Paris to New York. The Chinese have been quick to cast off the old love for the new. From all sides we hear of schemes of co-operation with Americans. Chinese-American banks, mining and industrial enterprises are all the rage. The French bank, which came to the rescue of a hard-up government in 1912-13, is ostracised. It was not included in the new French group in the consortium. So the Chinese (the very same officials who induced the French to enter the field in 1912) are now clamoring for a revision of the French contract. As a result, we have before us the following news items which appeared in the Shanghai Times on December 22 :-

"TRAMCARS FOR PEKING

"A FRANCO-CHINESE BANK TO SUPPORT ENTERPRISE

"Peking, Dec. 9.

"A decision has recently been reached among the Chinese officials and

capitalists to start a tramcar system in Peking shortly. This question has been frequently discussed, but the work could not be started owing to financial circumstances. The problem was reconsidered at the cabinet meeting December 7. It is understood that the work will be supervised by the Franco-Chinese Industrial Bank, which some years ago obtained the right for the construction of the tramway, and that the minister of the interior, Mr. Chang, and the former minister for finance, Mr. Wang Ko-min, will act as the leaders of the Chinese capitalists.

"REVISION OF CONTRACT

"In regard to the contract made by the Banque Industrielle de Chine for the construction of tramways in Peking in the 6th year of the republic, for which a large sum of money had been advanced, the government, on account of the said bank recently urging the fulfilment of the contract, has issued instructions to the ministries of finance and the interior respectively ordering them to make a revision in the contract in order to prevent the bank from making any further demands."

Co-incident with this comes the news that the Yunnan authorities have telegraphed a lengthy protest to Peking against the Banque Industrielle de Chine's railway contract, insisting upon its cancellation upon the grounds that work has not been started since the armistice. The protest gives ten "reasons" why the Peking government should follow the precedent created by the cancellation of the American Canton-Hankow concession. It reproaches war-scarred France with having now no money with which to carry out the French plans, and charges, that "they never intended to build the railway, anyway." The Yunnanese claim to be the only Chinese who sacrificed their lives in French territory during the great war, and in compensation, the French government should concede their request for cancellation of the railway concession and "refrain from further oppression of their provincials." The Yunnanese protest, as translated from the Chinese papers, covers several typewritten pages, and is valuable as indicating the re-birth of a provincial determination to be consulted in the construction of railways within provincial borders. The Yunnanese emphasize that this interference by the central government in provincial railway matters brought on the revolution of 1912, and they warn Peking that the people of Yunnan are as brave as the Szechuanese in defending provincial rights.

The upshot of the situation herein revealed is that the Peking tramway rights of the Banque Industrielle de Chine are to be set aside by Peking, while the Yunnanese, who were not let in on the ground-floor of the railway deal, are clamoring for the repudiation of the railway contract held by the same bank.

The moral of this story is obvious.

Friendly Advice from a Good Neighbor

DURING his recent visit to Peking, Baron Y. Fujimura addressed to the young men of Peking Christian University a speech that Young China will do well to commit to memory and adopt as a primer of good citizenship. The Baron represents the very best that is in Japan. A merchant prince who wields a power all his own in the House of Peers, he is a liberal with the saving quality of sound sense. Too often, liberals in politics are good-natured but still dangerous cranks. As Theodore Roosevelt once said, the sincere crank is often the worst enemy of real progress. Baron Fujimura is always reasonable and practical and very tolerant in his criticisms.

Everything that he said to the young men of Peking applies to all classes in the China of our time. Japan has pointed the way to China, and China's alternative to looking facts squarely in the face and taking a leaf out of Japan's book is certain and dismal failure.

Presenting a picture of Chinese actualities much finer than has been accomplished by any visiting western statesman or publicist that we can call to mind, this friendly Japanese recalled Japan's period of probation, danger and wholehearted effort in these words:

"As I recall the conditions 25 years ago, I distinctly remember that they bore a very close resemblance to the conditions now prevailing in China. I shudder sometimes with the sense of a hairbreadth escape, while walking in what were once 'foreign concessions' in such towns as Kobe and Yokohama, but which are to-day in a state of decline and

decay because the same forces of peaceful penetration or trade conquest which you see in China to-day were in full swing in my country, in those days. It is, indeed, a very narrow escape that we had; and, though there were some fortunate circumstances for Japan, we must say that we have to attribute our deliverance to the united patriotism and self-sacrifice of cur predecessors, many of whom are still alive."

Solid, wholesome truth. The Elder Statesmen of Japan were patriotic gentlemen. Young China, look upon their picture and then gaze upon your own Grand Old Masters of Graft! The history of nations is the story of men.



YOZO TAMURA

A Japanese engineer, who at 32 has been appointed American representative of the South Manchuria Railway and is here in New York to spend twenty millions for equipment.—From The New York World, Nov. 14.

"The Edgar Allen News"

A MINE that is constantly producing facts having a broad interest ranging over the engineering field is The Edgar Allen News. In admirable contrast to most house organs, it treats of subjects of general interest rather than the special lines which Edgar Allen & Co., Limited, have established as standard products in their own sphere. That, undoubtedly, accounts for the universal willingness of engineering editors to quote this very authoritative trade periodical. Here is a good example:—

"A reader of No. 7 of The Edgar Allen News noticing a paragraph refuting a suggestion that the cutting power of oil hardening steel is less than that of water-hardening steel, wrote to the Editors to suggest that there must be some reason or reasons for the theory being so generally held, and suggested an explanation. He pointed out that occasions arise when a tool or cutter made from a water-hardening quality of steel is, owing to intricate or weak design, quenched in oil with the object of minimizing distortion or the danger of cracks. These tools, though giving good hardness, seldom if ever, according to our correspondent, give good cutting power. In conclusion, he deduced from this that a distinction between oil-hardening steel and oil-hardened steel is necessary.

"In reply, it was stated that there is no reason at all for the alleged general opinion that oil-hardening steel will not carry so fine a cutting edge as a water-hardening steel. It has been said, and pretty generally believed by uninformed people, that the moon influences the weather, although scientists have repeatedly proved this theory to have no foundation in fact. An oil-hardening steel will take just as fine a cutting edge as a water-hardening steel. When a steel is quenched in water it cools more quickly than when it is quenched in oil. If the steel has been made to quench in water and is quenched in water the result will be satisfactory; but if, on the other hand, a water-hardening steel is quenched in oil, there is serious danger, unless it is a very thin section, that the time of cooling will be so prolonged as to miss the correct state of crystallization of the steel. If a tool is intricate, or of an extremely thin section, and it is desired on this account to harden it in oil, the steel maker should always be informed. He will then make

a steel of such a nature that there will be a wider range of temperature in which the steel can lose heat while being quenched, without missing the proper hardening conditions."

Making Dairen Premier Coal Port

FOLLOWING the lead of the Toyo Kisen Kaisha, the Osaka Shosen Kaisha has decided to make Dairen a port of regular call for its steamers on the Tacoma line, and European routes. Dairen is thus becoming an important shipping centre due to the efforts of the South Manchurian railroad company in improving the harbor and supplying coal at a specially reduced rate to vessels calling at the port. The accommodating capacity of the harbor is at present approximately 5,000,000 tons, but is expected to be enlarged to 10,000,000 tons in the near future. Price of coal supplied by the company to vessels calling at Dairen is about 5 or 6 yen per ton less than the rate at Nagasaki, so that a steamer consuming about 3,000 tons coal in a single voyage can save about Y.15,000 or Y.20,000 by taking coal at Dairen. Unless the price of coal at Nagasaki is reduced to the same level as at Dairen, and more facilities are given to steamers calling at the port, other steamers, including the liners of the Nippon Yusen Kaisha, may prefer Dairen to Nagasaki as a coaling port. The Mitsui Bussan Company was the first to make Dairen the starting point of its steamers running on the company's New York line. Now that the Toyo Kisen and the Osaka Shosen have decided to make Dairen as the port of regular call, a freight competition is anticipated to arise in the future.

That Boycott Fizzle

In the excellent company of our morning contemporary, the China Press, when the 1919 trade statistics were issued we drew attention to the manifest failure of the anti-Japanese boycott. There was, of course, injury to Japanese trade; individual firms suffered, Chinese merchants were embarrassed; but the boycott failed to achieve the wicked purpose intended. John is far too sensible to permit bile to interfere with business. He continued doing business with his Japanese business friends and this very fact should serve notice upon the prejudiced minority that Japanese business in China rests upon a substantial and safe foundation.

The Manchester (Eng.) Daily Dispatch for November 4, 1920, contains the following enlightening item:—

"Some interesting references to Japan's cotton trade with China during 1919 are given in Messrs. Noël, Murray and Company's piece goods circular, just to hand. The reports, which are extracted from official information, deal with the traffic of the Yangtze Ports, and in general a remarkable increase has taken place in the imports of cotton goods from Japan.

"Regarding Hankow, which may be taken as a representative port,

it is stated:

"A feature of the year, as has been the case for a good many years past, was the increase in the Japanese trade, not only in greys, but also in whitee and blacks—more especially Italians

in whites and blacks—more especially Italians.

"In catering for the China market Japan has many points in favor, among which the principal are lower manufacturing costs generally, rapidity of communication, and quickness of shipment, the latter of which becomes of vital importance to the dealer who does not desire to gamble to an excessive degree when exchange is fluctuating violently and a heavy penalty is demanded for forward fixtures. Although not equal to the English goods the Jap article is comparatively cheap, and it readily finds a market in these days of high values.

"In white shirtings to this port Japan supplied 238,671 pieces against 45,516 in 1918. Grey shirtings, English-made cloths, show an advance of 28,376 pieces, while total imports from all countries show an increase of 545,407 pieces, mainly due to Japanese importations, which

figure at 743,632 pieces.

"In heavier drills (12\frac{3}{2}\)-lb. and over), Japanese qualities rose from 65,072 to 101,221 pieces; T-cloths from 29,810 pieces to 38,915 pieces; Turkey reds, cambrics, and shirtings from 22,468 to 45,932 pieces. In cotton flannels nearly 79 per cent. of the total quantity was imported from Japan. Of the 73,175 pieces of cotton yarn imported, 68,954 came from Japan.

"Regarding the prospects of the Shanghai market, the circular is somewhat pessimistic. Fears are expressed regarding the famine in North China, which is expected to have an adverse effect on cotton

goods for a long time to come. The tightness of money is another factor retarding business."

Coming from Cottonopolis, where business is business, there are numerous indications of lively Lancashire interest in the new phases of China cotton trade conditions. Manchester, Liverpool, Oldham, Ashton, Bolton and Blackburn are carefully scanning the Far Eastern field. The proposed commission of inquiry has not been dropped. We learn from the *Textile Mercury* (November 6, 1920) that

"Although the suggested commercial mission to China and the Far East, on lines similar to the one so successfully undertaken by the Blackburn Chamber of Commerce several years age, has been deferred, there is official assurance that the project has not been abandoned. The general feeling is that with events so disturbed at home and abroad, it would be unwise to press for the mission in the immediate future inasmuch as the observations of the commissioners would be based on abnormal conditions. Our correspondent was informed that steps would be taken to organize the visit next year (1921), and that arrangements with this end in view were already being made. The importance of such a mission is endorsed by the whole Lancashire trading community and also by the government departments."

The British commercial community in China will be certain to give the mission a worthy welcome.

Japan, Now, the Largest Manufacturer of China

APAN has taken the place of Germany as the largest manufacturer of china," according to D. L. James, of T. M. James & Sons, Trenton, N. J. "Before the war Germany led the world in the manufacture of china, but the war crippled industries of that country to such an extent that Japan forged ahead.

"Although the output of England is not so large as that of Japan, the quality of English china is the finest in the world," he continued. "This superiority is due to the fact that in the leading factories of England bone is mixed with clay.

"The English bone process was discovered a hundred years ago. Bone-made china not only has a finer lustre but is more durable. Of course there are many factories in England which make earthenware

and do not attempt to produce china."

Financial Disturbance in Japan Over

M. Inouye, governor of the Bank of Japan, reviewing the economic situation, says that Japanese financial disturbances have now practically subsided. The Bank of Japan's loans which had erstwhile been Y.500,000,000 have now been reduced to Y.100,000,000. The issue of notes has likewise been reduced. Nevertheless it was premature to conclude that a period of activity had recommenced. The incomes of those on salaries and of wage-earners has not materially diminished. On the other hand employees of companies affected by the slump and farmers faced with low prices for rice and raw silk must reduce their standard of living sooner or later. Therefore, the purchasing power was bound to diminish, causing a falling off in retail prices. All these things point to a continuance of quietness for some time to come.

Sir Arthur Yapp is visiting India. As Sir John Foster Fraser would say, here is a fine opportunity for one of Mr. Hearst's bright young men to "discover" the Columbus of Yap island.

Says the New York Times: "Of what use is it to shut out the Chinaman if you let in his peanuts?"

According to some American papers Mr. Frank A. Vanderlip is prominently mentioned as Mr. Harding's choice for Secretary of the Treasury. It would be a great thing for the stabilization of international commonsense if Mr. Vanderlip could be made Secretary of State.—Japan Times.

The Origin of China's Modern Troubles

By George Bronson Rea

IR John Jordan tells us that nearly all of the trouble that has arisen in China since 1895 was due to Li Hung-chang's diplomacy. Then, it was, as Sir John reminds us, that Li came under "the imperialist influences of Germany and Russia." The visit to Moscow of the mandarin marquis and the secret treaty of 1896 are deemed by the most distinguished British "Old China Hand" the sources from which have come most of the modern political woes of China.

The Russo-Chinese secret alliance of 1896 is the most vital

fact in the modern history of China and it proved the decisive fact in the modern history of Russia. It brought about the Russo-Japanese war and that war caused the first Duma revolution which sowed the seeds that were ultimately to raise Russia's red crop of Bolshevism—the sanguinary harvest of 1917.

Dr. E. J. Dillon in his Eclipse of Russia gave us the inside story of the triple alliance against Japan; the Russo-French-German combination of 1895 that revised the terms of the treaty of Shimonoseki and compelled the retrocession of the Liaotung littoral. At Paris, in 1919, Mr. Sazanof, president of the Russian council of ministers, disclosed to the supreme council of the peace conference the text of the alliance signed at Moscow in 1896 by the Marquis Li and Prince Lobanof-Rostofsky, who was at that time foreign minister to the newlycrowned Czar Nicholas. The English translation of this historic document is reproduced here for the benefit of serious, impartial students of Far Eastern problems. Its basic importance will be recognized at a glance.

While British, French, German and Japanese diplomats were well-informed as to the existence of this alliance—reference was made to it in European state papers and the London Daily Telegraph printed a version of it in 1910—it was not until the spring of 1919 that it was formally admitted by Russia. China has never acknowledged or repudiated

it. On May 17, 1919, the Russians in Paris, through the medium of Mr. Sazanof, entered a formal caveat against revision of any of the Russo-Chinese commitments, presumably including the Moscow bargain. On October 11, 1920, Foreign Minister Yen of China declared that the Chinese treaties with Russia have not been abrogated. The statement of Dr. C. C. Wang regarding the Chinese Eastern Railway is additional testimony that the Chinese respect Mr. Sazanof's caveat and do not intend to take advantage of Russia's present weakness.

It is a pathetic commentary upon the efficiency of the American state department that up to the present moment the fact of the alliance has not been admitted. Quite recently the department clung to the view that "the asserted alliance" was "the spurious Cassini convention" and that "the Cassini convention was a combination of the Russo-Chinese railway agreement and a secret treaty prepared by Russia but unsigned by China." The department was not well informed. President Wilson apparently re-



HIS EXCELLENCY LI HUNG-CHANG, Grand Secretary of State, Viceroy of Chihli, etc., etc.

OF) RUSSO-CHINESE ALLIANCE
—While attending the coronation
ceremonies of Emperor Nicholas at
Moscow, in May, 1896, Li Hung-chang
concluded with the Russian Minister
for Foreign Affairs (Prince LobanofRostofsky) a secret treaty of alliance.
The following is an English translation
of the French text:—

"ARTICLE I.—Every aggression directed by Japan, whether against Russian territory in Eastern Asia, or against the territory of China or that of Korea, shall be regarded as necessarily bringing about the immediate application of the present treaty.

"In this case the two High Contracting Parties engage to support each other reciprocally by all the land and sea forces of which they can dispose at that moment, and to assist each other as much as possible for the victualling of their respective forces.

"ARTICLE II.—As soon as the two High Contracting Parties shall be engaged in common action no treaty of peace with the adverse party can be concluded by one of them without the assent of the other.

"ARTICLE III.—During the military operations all the ports of China shall, in case of necessity, be open to Russian warships, which shall find there on the part of the Chinese authorities all the assistance of which they may stand in need.

"ARTICLE IV .- In order to facilitate the access of the Russian land troops to the menaced points, and to ensure their means of subsistence, the the Chinese government consents to the construction of a railway line across the Chinese province of Amour (i.e., Heilungkiang) and of Guirin (Kirin) in the direction of Vladivostok. The junction of this railway with the Russian railway shall not serve as a pretext for any encroachment on Chinese territory nor for any infringement of the rights of sovereignty of his Majesty the Emperor of China. The construction and exploitation of this railway shall be accorded to the Russo-Chinese Bank, and the clauses of the Contract which shall be concluded for this purpose shall be duly discussed between the Chinese Minister in St. Petersburg and the Russo-Chinese Bank.

"ARTICLE V.—It is understood that in time of war, as indicated in

Article I, Russia shall have the free use of the railway mentioned in Article IV, for the transport and provisioning of her troops. In time of peace Russia shall have the same right for the transit of her troops and stores with stoppages, which shall not be justified by any other motive than the needs of the transport service.

"ARTICLE VI.—The present treaty shall come into force on the day when the contract stipulated in Article IV, shall have been confirmed by his Majesty the Emperor of China. It shall have from then force and value for a period of fifteen years. Six months before the expiration of this term the two High Contracting Parties shall deliberate concerning the prolongation of this treaty."—From America's Aims and Asia's Aspirations, pp. 456—7.

frained from taking even the responsible officials into his confidence. The Russian secret was well kept. It never got between the covers of a book until the Century Co. published the Far Eastern history of the peace conference by the editor of The Far Eastern Review. Yet, knowledge of this instrument changes the whole force of modern Far Eastern history. Here are the facts in brief:

The United States contracted with Korea (along the lines of previous treaties with China and Japan) to befriend her in her relations with the other powers;

China successfully vetoed Korea's attempt to hold direct relations with the United States;

China and Japan waged war over Korea, Japan won the war and China ceded the Liaotung littoral, etc., and surrendered her Korean protectorate;

Russia headed the tripartite combination against Japan and compelled Japan to relinquish the Liaotung littoral;

The Li-Lobanof (Moscow) alliance between Russia and China against Japan and England;

The consequent alienation of all the chief northern ports of China, Germany seizing Kiaochau in compensation for Russia's acquisition of the Liaotung region;

The American occupation of the Philippines, a compulsory, accidental, but none the less complete reversal of previous American Asiatic policy;

The Hay "Open Door" circulars accepted and nullified by contrary secret agreements;

Japan seeks an alliance with China, Peking is prevented from entertaining Japan's proposals by all the western powers (including the United States);

The Boxer war and Russian occupation of Manchuria; Russia, at the personal instigation of Emperor William, advances to take Korea, completion of the tran-Siberian railway and formation of the Yalu Timber (Bobradanof) Co.;

Japan (through Baron Rosen) seeks an amicable understanding with Russia;

The Anglo-Japanese Alliance (the British and Japanese answer to the Li-Lobanof Alliance);

The Russo-Japanese war and the treaty of Portsmouth, with its Rockhill-Roosevelt clauses attempting to save Manchuria to China;

Application of the Ito-Motono policy which adjusted Russo-Japanese differences on the old principle of "dividing the spoils."

The more recent facts are fairly well known and understood. They take on a different appearance when considered as the consequences of the facts here epitomized.

The key to the Chinese political puzzle has been the Li-Lobanof Alliance. The secret diplomacy of Li, Count Cassini and the subtle old masters of the "Singers' Bridge" compelled England and Japan to act in defense of their Far Eastern interests. A careful reading of the provocative correspondence carried on by Emperor William with Czar Nicholas justifies each and all of the steps that were taken by the London foreign office and the elder statesmen of Nippon. It proves positively that from first to last the policy of the "Open Door" was doomed to disappointment and to defeat.

Mr. Hay was not deceived. Mr. Choate was not deceived. Among the most interesting and instructive documents in the archives of the American government are the confidential notes and memoranda exchanged by Hay and Choate while the "Open Door" was being painted and varnished to suit the harsh extremities cold-bloodedly created by secret, old diplomacy. Choate shut himself up in his study, one evening, and wrote a remarkable summary of the actual situation. He sensed the existence of the Li-Lobanof bond. He wrote just as he felt and some of the things that he put on paper in his bold, flowing hand would have played

the very devil with "the concert of Europe." Hay wrote to Adams: "We cannot publish all the documents without breaking off

relations with several powers."

Many years later, during his brief period of retirement, Choate told the whole story to the editor of The Far Eastern Review, who had studied the correspondence and enjoyed the ambassador's plain language about Nicholas and William. Lord Salisbury, Lord Lansdowne and Mr. (afterwards Lord) Bertie did all that was humanly possible to meet the wishes of Hay and McKinley. American policies, however, could not and did not meet the rude necessities of the case. So the "Open Door" became the worst jest of modern international relations, and American policy in the

It is high time that the real friends of China take full cognizance of the Li-Lobanof Alliance and do justice to that sound British diplomacy which has met realities with practical efficiency. While American Far Eastern officials have insisted upon living in a false atmosphere of sentimental tommyrot, closing their minds against

Far East "came the cropper" that Hay, himself, had predicted

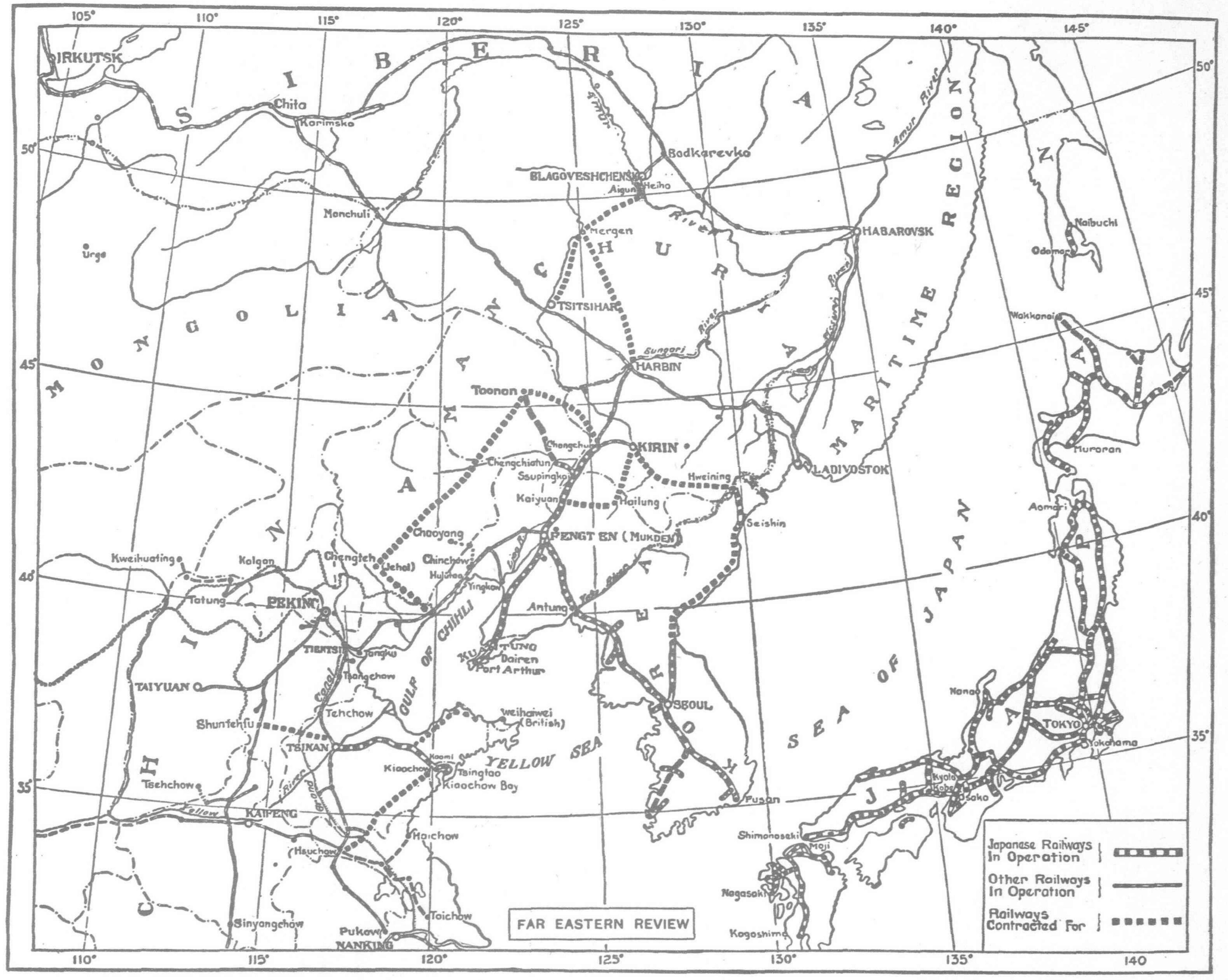


COUNT CASSINI

Who, as Russian Minister at Peking, exercised a Dominant Influence upon Li Hung-chang

facts and romancing about an "Open Door" that never actually existed, the British have gone about their Far Eastern business skilfully and successfully. It was in an earnest effort to brush away the cobwebs and unveil that truth that the publisher of The Far Eastern Review printed last year for private circulation among those interested a monograph entitled The Breakdown of American Diplomacy in the Far East. The "breakdown" was obvious to all who attended the Paris conference. It was due to ignorance, to stubbornness and to the wilful perversity of a few men who abrogated to themselves the power to twist American policies to suit pet schemes and preconceived prejudices.

Unless her people will it, China need not be bound to the chariot wheels of the Li-Lobanof anti-Japanese and anti-British policy. The people of China can say that they were not consulted in the matter by Li or his imperial mistress, Tzu Hsi. In which direction do they seek the salvation of China? As an ally of peace or as a provocation towards a future war? If the Waichiaopu has nothing better to offer China than the manners and methods of the old Tsungli-yamén then nothing is more certain than that China's future is chockful of dangers for herself and for all the powers. If Dr. Yen's policy repudiates the rotten old legacy of the Li-Lobanof



MAP OF NORTH CHINA

showing the railways contracted for with Japanese financiers, as well as the lines contracted for with the Russo-Asiatic Bank, in northern Manchuria.

A study of this map will disclose the true significance of the proposed Japanese railways in Manchuria and Inner Mongolia. Instead of being aimed at Peking and the domination of north China, they are purely strategic lines, the outer defenses of Japan against the advance of Russia from her preponderating superior positions on the north and west. The projected lines from the sea at the Korean border to Kirin, Changchun and Taonan, mark the northern line of defense. The strip between these lines and the Chinese Eastern railway is neutral ground, the no-man's land between the two fronts. When Russia extended her "protection" to Mongolia in 1912 and provided her armies with a free access to Japan's exposed western front, the latter was compelled in self-defense, to demand the rights to the railway from Taonan to Jehol. The Japanese subsequently advanced funds for the Peking-Kalgan-Tatung line, which brings this also under their influence. The lines from Harbin and Tsitsihar to Blagoveshchensk represent the Russian strategic lines conceded in 1916 by China to the Russo-Asiatic Bank, compelling Japan to strengthen her position in the south.

The weakness and inability of China to protect her capital and northern approaches from a Russian advance, compels Japan to step into the breach for her own security. The projected railways are therefore not only essential for the protection of Japan's position, but imperative for the defense of China. They should be constructed at once, and jointly defended for the common interests, and, as the first move to a deeper penetration of Mongolia that will open up this vast empire to colonization by the yellow race.

This map will also show the compelling motive behind Japan's entrance into the war. An Allied victory, with Japan on the outside, would have given to Russia the rights held by Germany. The Russian strategic railway system would have debouched upon Shantung from the Shuntehfu-Tsinan line to Tsingtao, while the Central Asian trunk line would have followed the Hsuchow-Kaomi project to the same deep water terminus. Russia would have dominated Shantung. Japan would be surrounded on all sides by the strategic railways of her dreaded enemy, and in time, would have had to bow to the inevitable and withdraw from the mainland, or make her last stand for national existence in Southern Manchuria or Korea.

alliance now would be the best possible time for China's foreign minister to make that point clear. How about this, Dr. Yen?

Every important move made by Great Britain in China since 1895 has been one of self-defense, a constant struggle to outwit secret Russian manœuvres by open moves and to preserve her own Asiatic empire. In the same way, every move made by Japan in Asia has been dictated by the law of self-preservation—the determination of a nation of men to safeguard their own empire, constantly jeopardized by the Li-Lobanof alliance.

To vindicate the truth, and in hearty appreciation of the manly frankness of Sir John Jordan—a real friend of the Chinese people—the following extracts are reprinted from the monograph above-mentioned, The Breakdown of American Diplomacy in the

Far East :--

The Problem of Asia

"Approach as near as possible to Constantinople and India. He who establishes himself in these two places will be true sovereign of the world." These are not the words of a German strategist, but the legacy of advice that Peter the Great bequeathed to his successors; a legacy that was followed out to the letter.

"The more powerful Russia becomes in Central Asia, the weaker does England become in India, and, consequently, the more amenable in Europe," said General Sobolev. Russia attempted no concealment of her real aim. India was, and still is, to Russians,

the land of fabulous wealth.

"India, is the key-stone of the British Empire; without India, the Empire would cease to exist. British policy in Asia must be moulded from the standpoint of its effect on the preservation of British domination in India. . . The concession of a port upon the Persian Gulf to Russia by any Power, should be regarded as a deliberate insult to Great Britain; as a wanton rupture of the status quo, and as an intentional provocation to war; and he should impeach the British Minister, who was guilty of acquiescing in such a surrender, as a traitor to his country," said Lord Curzon, the greatest of England's Indian Viceroys.

In these two quotations, the problem of Asia is laid before us; Russia's open determination to conquer India, and Britain's firm resolve to defend her possessions. The present generation forgets that twenty, thirty years ago, Russia was the menace to world peace. Russia was then running amuck throughout Asia, slaughtering, devastating and annexing the remnants of the older civilizations. The Caucasus and Trans-Caspia were conquered, Merv was annexed and the legions of the Czar were at the Gates of Herat, the outwork of India. With Askabad as a centre, a network of Russian intrigue was spread over southern Persia to establish the Czar's supremacy on the Persian Gulf and the Indian Ocean through means of a railway. "In order to be there before the Germans," they said. Her right to such concession became an article of faith on the banks of the Neva, and was soon evolved into a sort of bureaucratic Monroe Doctrine. Northern Persia was brought under the influence of the Czar through the completion of the Trans-Caspian railway.

"Every kingdom, principality, or tribe to which Russia has extended 'protection,' has eventually been appropriated into the Muscovite Empire. Russia has seldom, if ever, permanently retreated from any spot where her authority has been established." Where her flag is once raised, it stays, unless hauled down by superior force. "The clue to her success is the intelligent ruthlessness of Russian warfare, when warfare must be waged. When she sends out a punitive expedition, no mercy is shown, even women and children being sacrificed in order to further her aim of a complete subjection. Skobeleff sounded the key-note of Russian policy, when he said "my system is this-to strike hard and keep on hitting until resistance is completely over; then at once to form ranks, cease slaughter, and be kind and humane to the prostrate enemy. By this system, Russia has absorbed more territory, assimilated a greater number of different peoples, and fought more border wars than any other modern nation, and in the whole course of her ceaseless march there has never been a single uprising against

her authority once that authority has been established. Russia's methods of warfare, her showy Asiatic magnificence, her iron hand under the velvet glove, impress the Asiatic. Her methods of wholesale slaughter which broke the spirit of Central Asia is claimed by Russians to be cheaper, quicker and more effective, and in the end, the most humane."

By this system, the Russian military juggernaut crushed out the life of the little peoples of Asia, as the first step toward the conquest of India. Only the most determined moves on the part of England halted the Bear at the Afghan frontier and prevented Persia from being absorbed, and India flanked on its most vulnerable side.

Checked temporarily in this direction, the Russians swung rounds into the Pamirs. The Hindu Kush, the natural boundary of India, was proclaimed as the frontiers of Russia in Central Asia. Chinese Turkestan was brought under the influence of the Czar; the Ili district remains Chinese in name only. Russian agents invaded Tibet. Military exploring parties disguised as scientific expeditions swarmed over the Roof of the World mapping out the passes in the Himalayan wall through which the hordes of Russia could sweep down into the Garden of India. Britain was compelled to annex Sikkim, and, when the emissaries of the Czar won over the Dalai Lama, was again forced to act. The Younghusband expedition was the result, and Tibet forever lost to China.

Russia's direct advance on India was halted, and once more she started to clear the trail for another flank movement. Japan was deprived of the fruits of her victory over the Chinese; the traditional enemies of England standing solidly together to further the designs of Russia.

The secret Li-Lohanof alliance entered into in 1895, following the Shimonoseki Treaty and the Imperial Rescript surrendering Japan's position in Liaotung, was the starting point of China's troubles. It was an open payment by China to Russia for compelling Japan to forego the fruits of her victory. It was China's revenge. She opened her doors to the armies of the Czar and paved the way for the subjugation of Japan. Not only did China consent to the leasing of Kiaochao to Russia as a naval base, but the undisputed possession of Port Arthur and Talienwan (Dalny) in the event that Russia became engaged in hostilities with any other Power. There was only one interpretation to be placed on these moves. Japan was to be crushed; punished for daring to interfere with Russia's self-imposed monopoly of subjugating the peoples of the Asiatic mainland. Russia's breach-of-faith with her German partner in the matter of the Russo-Chinese Bank, determined the latter to forestall her in Kiaochao. China would have gladly handed over this important harbor and potential naval base to her great and good friend, Russia; in order to facilitate the latter's attack upon Japan and gratify her desire for revenge. Germany's prompt and dramatic move in stealing a march on her perfidious Ally obtained for her the 99-year leasehold on this coveted strategical position. In our haste to condemn Germany and throw stones at Japan let us not forget this initial compact between China and Russia which compelled the other Powers to move at once to protect themselves. It may be true China had a perfect right to cede her possessions to Russia, but when the exercise of this prerogative becomes a direct menace to the political existence of her neighbors, it may be indulged in only at the peril of immediate reprisals. Mexico, in the full enjoyment of her sovereign powers, may be justified in ceding a naval station to a foreign nation in some of the Lower Californian bays. The Central or South American States may, with equal right, convey similar privileges that might become a strategic menace to the American defense of the Panama Canal, but no explanation these governments could give, would deter the United States from placing a peremptory veto on the transfer and of exacting compensatory damages and guarantees for their future good-behavior.

For over a century, the full weight of Britain's diplomacy, and at times, her military and naval power, had been exerted in blocking Russia's designs to oust her from India and obtain an ice-free port on the coasts of Asia. Yet here was China, smarting under her humiliation at the hands of Japan, gleefully handing over her three choicest ports in North China to the dreaded and avowed enemy of England. Experience had taught England that when Russia moved in Asia, it behooved her to act quickly. Japan could do nothing. The coalition against her was too powerful. She could only sit by and watch the preparations being made for her funeral. Her only friend was England, whose vital interests were also placed in jeopardy by the folly of China. This fundamental truth must never be lost sight of in attempting to understand the subsequent moves of the Powers in China. This is the beginning; the key to the puzzle.

Great Britain had declared that any Power which conceded Russia's right to a port on the Persian Gulf, would be considered as an enemy. Britain would go to war immediately to protect this strategical approach to India from its weakest and most vulnerable side. Russia on the Persian Gulf, or in the Pacific, meant that the day must come when England would have to fight for the existence of her Empire. When China opened her doors and brought Russia down to the warm-water ports of the Yellow Sea, she placed herself on the side of England's enemy. She became an active ally of

Russia.

When Russia moved, her French Ally moved with her. The treaties amply prove that there existed a decided tendency to create and preserve preferred spheres in other parts of China before Germany applied the "Mailed Fist" at Kiaochao. Britain was entrenched at Hongkong. The French non-alienation agreement covering Hainan of March, 1897, was only the corollary of her Ally's moves in the North. China was caught in the Franco-Russian trap, which caused Great Britain to demand the nonalienation declaration creating the Yangtze Valley sphere in February, 1898. It has been urged that the declared intention of Germany to demand Kiaochao, precipitated the British move in the Yangtze. If we can visualize the great struggle being waged at that time with India for the prize, and the elimination of England from Asia, the picture will disclose that when China gave her two best northern harbors to Russia, and France obtained recognition of her position in Hainan, Hongkong was placed between England's two most powerful enemies. "It is from jealousy of India and to impair the position which India gives to Great Britain in the Far East that France has again embarked upon an Asiatic career, and is advancing from the south-east with steps that faithfully correspond with Russia upon the north-west," wrote Lord Curzon in 1900. The precedent for the creation of spheres of influence was therefore created by France several months before the German missionaries were murdered in Shantung. When Germany obtained Kiaochao, France followed by exacting from China a further non-alienation agreement covering South China. Eight days later (April 18, 1898), Great Britain supported Germany's rights in Shantung by renouncing all intention of connecting Weihaiwei by railway with the Shantung hinterland, thus conceding to Germany a monopoly in the exploitation of that province. The week following, after all the other Great Powers had delimited their strategical positions, Japan, supported by Great Britain, obtained the nonalienation declaration embracing the province of Fukien, which not only protected her position in the Island of Formosa, but interposed an additional buffer between Russia on the north and France on the south. On June 9, Great Britain demanded and obtained the lease to the Kowloon Territory. The inability of China to defend her neutrality, compelled Great Britain to exact this lease as the only protection to Hongkong against a land hombardment in the event of hostilities. On July 1, she obtained the lease to Weihaiwei, where her fleet had been anchored since Russia swaggered into Port Arthur across the strait. Keep in mind the fundamental facts about Russia and the subsequent events are entirely comprehensible.

Russia was then teaching the world a new lesson. "By her forethought, energy and fertility of resource, she led the way and taught the Powers how to conquer by railways. She alone recognized how much more valuable are communications than mere

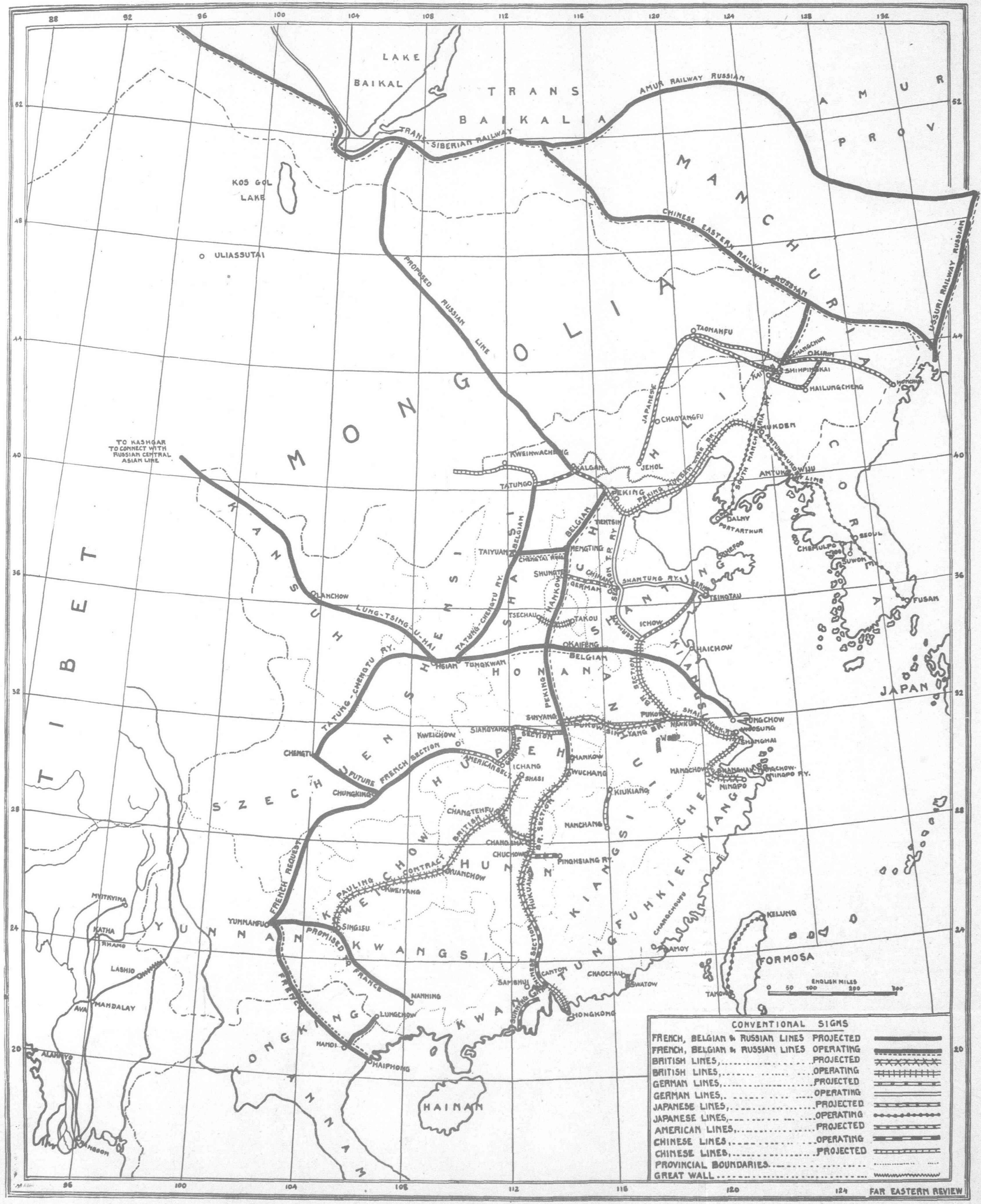
army corps; how necessary in a nation's affairs is a fixed plan. Russian railways, made by Russians for Russia, ran straight across Asia from Moscow to the China Sea, from Batoum through Trans-Caspia to the western gates of the Chinese Empire, and to the Herat province—the key of Afghanistan and the outwork of India. Both in the Far East and Central Asia, the Russian railways are to be gradually carried further south-through China to the Yangtze Valley, and through Persia to the Indian Ocean. At the same time, she is pushing her feeder lines southward into Europe's sphere of influence to gain a commanding influence in Turkey and Persia. The old idea of a direct invasion of India has been for the time being, at least, abandoned, and in its stead, the plan has been adopted of commanding Central Asia, Persia and Afghanistan by means of railways and of reaching India's north-eastern frontier by way of China. Wherever Russia can develop cultivation she will provide storehouses for the time when she wishes to introduce an invading army. When she can develop her railway systems, she will have the means of transport ready to hand. She aims at recreating the fertility of the Central Asian steppes and thus forming fresh bases for further advances." Thus wrote Archibald Colquhoun in 1900.

Russia did nothing by halves; she worked on a big scale with fixed objects in view. "Run back over Russia's far-sighted and patient policy, which has always looked ahead and considered the needs of the Russian people a century beyond the present moment, and perhaps an explanation will spring from these combined considerations." Halted on all sides by the swift and certain strokes of British diplomacy backed by a naval supremacy that no one Power or coalition of Powers dared to question, she resorted to subterfuge to accomplish what could not be done openly.

Once again Britain scored by binding Russia through the Scott-Muravieff agreement to confine her activities north of the Great Wall of China, and again, Russia broke her pledged word by employing Belgium, operating with the financial support of France, to extend her tentacles toward south China, and the coveted north-east borders of India. "It has been abundantly proven that Russia's pledges were given merely as a matter of diplomatic expediency to be broken whenever convenient." Her policy was to take advantage of the slightest opportunity offered. Merv was annexed when England was busy in the Soudan; the Central Asian railway was pushed up to the borders of Afghanistan. Tibet nearly fell into her maw during the Boer war. Manchuria was occupied during the Boxer troubles, and Mongolia declared independent when China was in the throes of a revolution. Russia never overlooked a trick.

When Russia moved in Asia, France, her Ally, moved with her. France was helpless, bound to Russia's chariot by chains of gold. "Between the French Republic and the Russian Autocracy exist the most perfect and smoothly working governmental and diplomatic understanding of modern times. It is a singular illustration of the influence of hatred and interest in making a combination between two peoples unlike in temperament, ideas, and methods. Their alliance was born of their common fear and hatred of Germany and England-of the numerous conflicts of German and English interests with Russian and French interests. And so, in their foreign policy, and particularly in their Oriental diplomacy, they might almost be said to work as one government. So far as the rest of the world is concerned, French diplomatic agents in Asia operate in understanding with Russia; and the reverse is also true." These are the words of Senator Albert J. Beveridge in his book on the "Russian Advance" written in 1903. Every mile of Russian railways in Asia was built with French money; when Belgium entered the Chinese field on behalf of Russia, French capital subscribed to eighty per cent. of the loan issues.

So, when England, fighting for the life of her Empire, called checkmate time and again to Russia's moves on the diplomatic chess-board, the latter turned to little Belgium to play her game secretly. Russia's program was to divide China in half by a north and south railway that would link her Manchurian and projected Monogolian systems with the lines of her French Ally on the south,



POLITICAL RAILWAY MAP OF CHINA

This map was printed by The Far Eastern Review, in 1914, to illustrate the political connection, Japan cannot relinquish the right to partial and strategical significance of the Russo-Belgo-Franco railway contracts, which divided China by a north and south and east and west trunk system, permitting Russia to join hands with her French Ally on the south and opening up a deep water port at Tungchow for the Lung-Tsung-U-Hai (Central Asian) line. This map also gives a clear idea of the meaning of the Japanese lines in Manchuria, which are shown to be purely strategic frontiers against the pressure of Russia. The map will again help to an understanding of what an Allied victory, with Japan on the outside, would have meant. The entire Russo-Belgo system in North China would have found its outlet to deep water over the German lines, and Japan would have been surrounded on all sides by Russia. To avoid such a possibility, Japan had no alternative other than to attack Germany at once, without delay, or assistance from her Ally. She could take no chances of having Russia demanding the right to co-operate in the Tsingtao campaign and participating in the fruits of victory. As long as the Belgian concessions are held binding with

control over the German railway concession, which, under complete Chinese control, would be hypothecated without delay to some agent of Russia, in the same manner that they handed over the Kalgan line to a Belgian syndicate operating as part of the official Russian Group.

The dotted lines in south-west China indicate the extent of the South-western Trunk System that was offered to the American Group in 1913 by the Deputy Director-General of the Chinese National Railway Corporation, holding the power of attorney, Dr. Sun Yat-sen, and which was rejected. At that time, these lines did not conflict with the rights of any other Powers. They were free from international political complications, and would have provided an outlet for American capital and industries equal to, if not greater, than any of the European Powers. This was the last opportunity presented to American capital to acquire Chinese railway rights that would have brought them in on "the ground floor" without international complications.

and so bring their armies nearer to the coveted north-eastern frontiers of India. A Belgian syndicate backed by French capital and in partnership with the Russo-Chinese Bank, obtained the great Peking-Hankow railway concession after the Chinese had solemnly promised Great Britain that Russia would not be admitted to participation in the deal. At the same time the Russian combination acquired the rights to the Chengtai and Pienlo railways, as the first links in other grandoise schemes for the subjugation of China. Again China willfully played the Russian game and brought her another lap nearer her goal, and, once more, Britain countered and compelled China, under threat of an ultimatum, to concede compensatory damages, that would enable her to hold her strategic position in central China against the onward march of the Bear. The set determination to maintain at all costs her strategic position is disclosed in the curt, concise instructions to the British Minister at Peking when the truth was learned as to the Russian participation in the Belgian concession. "You are authorized to inform the Tsungli yamên, that unless they agree at once (to the demands for compensatory railway rights) we shall regard their breach-offaith concerning the Peking-Hankow Railway as an act of deliberate hostility against this country, and shall act accordingly. After consultation with the Admiral, you may give them the number of days or hours you may think proper within which to send their reply." There was no trade policy in such a note. It breathes the spirit of a government grimly determined to resort to instant hostilities against the deceitful action of China in opening her doors to the enemies of England in order to facilitate their advance upon India. This is the reason underlying Britain's demand for recognition of her predominance in the Yangtze Valley. It is her one bulwark against the slow, cunning, moves of Russia to oust her from India by an attack through the territories of China. As China cannot defend herself or preserve her neutrality and guarantee the British Empire from attack, her territory becomes the strategic frontiers of India; England must dig herself in, in the Yangtze regions.

Once more England called check by placing the Yangtze valley between India and the Colossus of the North. Then the Americans broke into the field and thwarted her well laid plans. The American-China Development Company, holding the concession for the southern half of the great north and south trunk railway from Hankow to Canton, permitted the Belgians to obtain control of its stock in the open market, and were about to step aside and hand over the administrative control. Russia almost attained her object. Her Belgian agent controlled the line from Peking to Hankow, and the Americans made them a present of the southern half to Canton. Is it any wonder that the campaign was initiated to oust the Americans, and the British press clamored for the surrender of the concession? Once again, the British position was menaced, and again, by heroic diplomatic teamwork, they obtained a hard and fast option on the rights to this line; a right they have not sacrificed in its internationalization under the Hukwang Loan.

While her Ally and Agent were carrying her plans into execution in prohibited spheres, Russia was playing an energetic game of her own in the north. The Boxer uprising provided her with opportunity to flood Manchuria with troops and entrench herself. Harbin rose like a boom town on the broad expanse of the Manchurian prairies and became the Far Eastern capital of the Czar, the strongest military encampment of Eastern Asia; Port Arthur was hurriedly transformed into an impregnable naval base and the city of Dalny created over night like an Arabian Night's Dream? When the Allied Powers were negotiating the Boxer terms, Russia, working independently, was forcing China to sign a separate secret treaty which would have clinched her domination over Manchuria and prohibited China from constructing railways in any of her provinces bordering on the domains of Russia? Again England had to act quickly to save the situation. This time (October 6, 1900) she' entered into an alliance or understanding, not with the United States, the champion of the Open Door policy, but with Germany, in which the two countries were to stand together to oppose Russia's covert attempt to take advantage of the situation for selfish ends.

Again, China was about to play the Russian game and sign the secret treaty. Only under pressure from the other Powers, did she finally make known the extent of Russia's demands. Backed by their support, she refused to sign and Russia withdrew.

Harassed and beset on all sides in Asia through the activities of the coalition seeking to undermine her position in India, and handicapped through the incompetency and inability of China to protect her territories against the menace from the North, Great Britain threw her fortunes in with Japan, and in 1902 signed an alliance with the rising Oriental Power. This combination of Democracy with an Oriental Autocracy has been severely criticised and condemned, but an impartial study of the diplomatic game in Asia will fully justify its necessity. The gold of Republican France was supplying the motive power for the Autocratic Russian machine in Asia, and, secretly encouraged by Germany, the combination on one side, was bent on absorbing Persia in order to attack India, and on the other, snuffing out thein dependence of Korea as the first step in the throttling of Japan. Britain was isolated. The great White Powers of Europe were combined against her. The instinct of self-preservation threw Britain and Japan together against a common enemy. It may have been an unholy alliance, but from the viewpoint of practical diplomacy it was absolutely justified, and, harp as we may, it stands as the one guarantee of a permanent peace in the Far East, the one formidable check to the never changing policy of Russia, the one safeguard for the defense of the British Empire and the future existence of Japan. Once again, the Open Door doctrine which could not be relied upon to check Russia, had to give way to a more practical instrument of defense. The alliance worked, it accomplished its purpose. Raising her paw from the vantage point presented by China to snuff out the life of Korea, the Russian Bear received the first set-back in her long and bloody career of annexation of little nations. The paw came down upon the upraised bayonets of Nippon. Discomfited, sore, surly and revengeful, Russia withdrew temporarily from South Manchuria to her second line of defense north of the Sungari, still holding her ground within the territory of neutral China.

Japan was compelled to fight for her life. Only by a superhuman effort, a terrible sacrifice of blood and treasure, was her independence assured and the menace hurled back to the frozen fastnesses of the north. Who was to blame? Japan did not invite the war. She fought China ten years previous, and imposed terms deemed essential for her future protection against aggression, by insisting on the cession of the Liaotung peninsula. Japan followed the same law in imposing terms upon China that has since been followed by the Great Powers in their peace negotiations with Germany. This insurance against attack was denied to her by a coalition headed by Russia intent upon her subjugation. China willingly allied herself with and handed over to Russia what had been denied to Japan, not only as a grateful present for services rendered, but to be revenged upon her late antagonist. Russia lost no time in pushing her advantage. Manchuria was flooded with troops. Harbin, the administrative centre of the railway system, became the Far Eastern military capital of the Czar. From this vantage point, within the confines of China, and from the strongholds of Port Arthur and Dalny, Russia concentrated her energies toward the absorption of Korea and the annihilation of Japan.

Before the Chino-Japanese war in 1895 it may be said that Russia had no army in the East. Not until work began on the Chinese Eastern Railway did her troops begin to pour into Manchuria. The Boxer outbreak in 1900 provided an opportunity and at least 60,000 were marched into the province. In another year this was increased to over 150,000 and during the next three years this number was doubled. China was fully aware that her territory was to become the scene of a terrible war. Russia was mancuvring to extend her influence over Korea. China had gone to war with Japan in 1895 over Korea. She made no move to oppose Russia operating from within her territory. China cared nothing about Korea as long as vengeance was visited upon Japan. Her weakness, venality, duplicity and playing one Power off against the other to save herself, bore its fruit.

And when the terrible sacrifice was completed; when the two armies stood face to face in the bleak desolate regions of the Sungari, far from their bases of supplies; broken and unable to carry on, the line was then delimited which marked their future strategic positions within the neutral territory of China. As long as Russia maintained her position in Northern Manchuria and held Harbin as a base, Japan dared not withdraw. To have retreated and surrendered her strategic footing gained at such a terrible cost, would have again handed over the fruits of victory to Russia. China would have once more opened the flood gates for the armies of the Czar to return to Mukden, Port Arthur and the banks of the Yalu.

Russia held fast to her strategic position in Manchuria and initiated those tremendous preparations for a war of revenge which kept the Far East in a state of inquietude since 1905. Hardly had the ink dried on the Treaty of Portsmouth, when she commenced feverish activities to retrieve her lost prestige and position in Asia. Until Japan was humbled, Russia could no longer safely lord it over the tribes and peoples of Asia. The peace treaty stipulated that the Chinese Eastern Railway, traversing the neutral zone of China, could not be employed for strategic purposes. Vladivostok, the Primordsk, and the Ussuri regions, were thus cut off from direct military contact with the rest of Siberia and Russia. Her eastern strongholds were isolated.

The war had been lost to the armies of the Czar because they tried to fight it at the end of four thousand miles of single-track railway, with their base of supplies in European Russia, and the line of communication broken during the long winter by the frozen expanse of Lake Baikal. Russia set to work to retrieve her mistakes. Huge appropriations were at once made for the construction of the Amur railway that would connect Vladivostok with the rest of the empire through Russian territory. This circumvented the clause in the treaty closing the Chinese Eastern railway for strategic purposes. The Trans-Siberian line was double-tracked. The Circum-Baikal link was completed. Vladivosiok was strengthened and made impregnable. The Ussuri region was colonized from southern Russia and the country criss-crossed with military roads. Trans-Baikalia was opened to settlement. Industries were created, agriculture encouraged and everything done to make this region a base of supplies for the forthcoming struggle. Russia was faithfully carrying out the policy so strikingly predicted by Colquhoun several years previous. There was no mistaking the purpose of Russia.

Japan stood amazed at these preparations for revenge. She was almost bankrupted by her struggle, yet compelled at all hazards to keep pace with the activities of Russia. Her armies were increased time and again, she hypothecated her last resources to strengthen her position. This is the sole reason for her militarism; obeying the same law of self-preservation that compels Britain to maintain her naval supremacy and France her military organization. Japan may be a military nation, she may have faithfully copied and admired the German system, but this does not warrant the accusation that she is on conquest bent. If Japan goes to sleep and listens to the siren song of the pacifists, her national existence would not be worth a moment's consideration.

Because of China's inability to defend her own or her neighbor's territory, and the venality of her statesmen who allied their country with and admitted Russia into Manchuria, Japan was compelled to fight one terrible war for independence. To preserve this dearly bought security, she was again forced through the inexorable exigencies of the military situation in Manchuria to violate her pledged word and annex Korea and maintain her strategic foothold within China's territory. Korea borders on the Maritime Provinces of Russia, offering a free and unobstructed passage to the armies of the Czar when again ready to move against Japan. The snuffing out of Korea's independence which constitutes one of the tragedies of recent years, was inevitable. If Japan had not stepped in and annexed the peninsula, nothing would have prevented Russia from seizing the first opportunity to occupy the territory as a base for her operations against Japan. If Japan had meekly given up her position in Manchuria and respected the independence

of Korea, she would simply have invited her own subjection; she would have committed hari-kari.

"The rights of smaller and weaker nations fade away and disappear when their governments through incompetency, corruption and general ineptitude endanger the life of stronger, better organized and developed states." The national life of Mexico would be snuffed out in a twinkling, if her present disorganized condition was ever employed by Germany or any other Power as the bridge over which our own independence was threatened or attacked. One such lesson is enough for any virile nation. As long as Russia holds Northern Manchuria and the Primordsk, Japan must, in self-defense, dig herself in in the south. It is the punishment that China is now receiving for her double dealing, and the price Korea pays for her continued disorganization and intrigues which invited her absorption by Russia.

Let us return to the chess-board. Russia very naturally attributed her defeat to the strong support tendered to Japan by Great Britain. She bided her time and awaited the opportunity that was sure to come. Then the Americans re-entered the labyrinth of Far Eastern politics by proposing the neutralization of the Manchurian railways, ignoring the tremendous struggle for Empire that was going silently on in the depths of Asia. The story of how this was rejected, is fresh in the memory of all. Then, finding someone she could play off against the others, China utilized the Americans to break the hold of Russia and Japan in Manchuria by conceding to the American Group an agreement for financing the Chinchow-Aigun railway. It was a foregone conclusion that it would be blocked, but sympathy for China caused Americans to take over the rights, and, by bringing in a British contractor to construct the line, hoped to win over Great Britain. The line was aimed at Japan's position, and it was hoped that British interests would influence British official support and take the ground from under Japan's opposition.

Who defeated this scheme, which, on its face, was a legitimate enterprise, well within the treaty rights of the United States to undertake and the sovereign power of China to initiate? It was not Japan. Backed by the full weight of French diplomacy, Russia emphatically refused to permit its construction, applying the principle that any Chinese railway that touched or paralleled her boundaries became a strategic menace to her military position. Russia went back to the principle that she tried to force upon China at the time of the Boxer troubles. The Chinchow-Aigun railway opened up a new line of communication from the south aimed at the heart of her Amur region, a highly important military alley that would fall into the hands of Japan at the first sign of renewed hostilities. Under the terms of the Portsmouth Treaty, Russia was prohibited from employing the Chinese Eastern line for military purposes. The new Amur railway then under construction, constituted her only line of communication within her own territory connecting Vladivostok and the Maritime regions with the rest of the Empire. With the Chinese Eastern line closed to military movements, the proposed new Chinchow-Aigun line therefore opened a clear and unobstructed passage for the armies of Nippon to strike at the most vital point in her new line of defense. In the event of Japan reaching the banks of the Amur, the whole Russian Empire east of Baikal would be at her mercy. Naturally, Russia, who thinks only in terms of military strategy, stubbornly refused to budge from her position. Japan was willing enough for the line to be constructed, provided she was permitted to participate, but this was rejected by China and America. It was Russia, and Russia alone, who blocked the concession. She called checkmate to England, and in so doing, established the principle that China cannot construct railways within her own boundaries which might become a strategic menace to her neighbors. The other great Powers did not oppose the imposition of the new doctrine, clearly foreseeing that the time would arrive when, because of the continued weakness of China, they would be compelled to invoke the same principle in defense of their own interests.

Russia then sat back and awaited the next move. This came with the Chinese revolution, providing the ever watchful Bear with another opportunity to shove his paw deep into the Chinese honey.

pot. Mongolia was declared independent and brought under Russian influence. The continued disorganization of the Chinese invited this rape of their territory. The strategic position of Russia was strengthened. The Cossack was brought to the Great Wall and Japan's position in south Manchuria outflanked. The weakness of China was again paving the way to the undoing of Japan. The amputation of Mongolia was simply another strategic move on the great chess-board of Asia which permitted Russia to set at naught the watchful preparations of Japan and facilitate a flank attack on her position from the west and south-west. Russia moved rapidly. No sooner had Mongolia been declared independent, and the Hutuktu and his Lama ministers bound hand and foot through the terms of a treaty recognizing Russia's pretectorate, than negotiations were opened in Paris for the immediate financing of railway lines within the new state, under a Russian guarantee as to princinal and interest on the loans. This told the interested Powers that Russia was again starting her plan of conquest or annexation by railways, leading up to the complete absorption of Mongolia. This Russian move forced Japan to extend her activities into Inner Mongolia. Here we have the sole reason for Japanese military operations in these regions; the compelling motive influencing Japan to embrace this region within her sphere of interest. If Japan refrains from pushing her influence deep into Inner Mongolia, Russia will employ the territory, when the time is ripe, to strike at Japan in Manchuria from her most vulnerable side. Once Russia gained the whip-hand in Mongolia, she applied her pet policy of closing the country to railway construction and Chinese colonization. Mongolia became a closed sphere, nominally independent under the suzerainty of China; in reality, another hidden empire to screen the forward moves of Russia toward her goals in India and Japan; a land that the Yellow Man might not live in. The rest of the world slept. The Czar was advocating World Peace, his Ministers were preparing for war. Russian policy never changes. She again scored.

Let us return to the situation in Tibet. The Younghusband expedition was sent to Lhasa in 1904, ostensibly because of a failure on the part of China to comply with the trade regulations agreed upon in 1893, in reality, to forestall Russia. As a result of the occupation of the sacred capital of Bhuddism, the Lama Hierarchy was forced to sign a treaty providing for the non-alienation of Tibetan territory to any foreign Power; the prohibition of foreign intervention in its affairs; the exclusion of all political agents or representatives; the interdiction of the revenues of the country being mortgaged, and, finally, closing the door to railway, mining and other development concessions. To this agreement, China was forced to assent in 1906. Russia also reluctantly accepted the accomplished fact and entered into an agreement with Great Britain to recognize the above conditions. Tibet was converted into a water-tight compartment, a buffer state, created to protect India against the forward march of the Bear. Britain scored. During the revolution of 1912, the Chinese were driven out of Tibet, and on January 11, 1913, her independence was declared by concluding a treaty with the Hutuktu, the ruler of Mongolia, who had passed under the thumb of Russia. In this, Russia scored, compelling Great Britain to call upon China for the negotiation of a new agreement concerning Tibet.

The struggle for Empire, for control of India, assumed a new phase with the return of Russia during the Chinese Revolution. Checked in her frontal march upon India through Tibet, Russia again retreated into the background and employed her Belgian agent and French financial partner to open up an oblique read through China. The Belgians appeared on the scene during the revolution. One of their first transactions was to advance a loan secured on the Kalgan railway, a line that Russia had kept her eyes on for many years, the only pass through the mountain wall between China proper and Mongolia. Again Russia scored and circumvented the Scott-Muravieff understanding, and Britain countered by having the Belgian loan absorbed into the general Reconstruction Loan advanced by the Consortium. When Russia was admitted into the Consortium the Belgian syndicate appeared

as the official Russian Group. One of these Belgian syndicates then obtained the concession for the great trunk-line from the sea at Haichow to Lanchow and beyond in the Kansu Panhandle; the centuries-old highway into Central Asia. This was the first half of the great trans-Asian line which would ultimately connect with the Russian system in Central Asia. The original deep-water terminus at Haichow was then shifted to Tungchow, located on the Yangtze River near its mouth. The Bear was at last in the Yangtze, squatting on the north bank and twiddling his claws at the discomfitted Lion across the river at Woosung. Russia had not only sneaked into the Yangtze Valley, but had set at naught all the carefully laid plans of Britain in Tibet, by flanking this territory all along its northern borders. The work of a century of British diplomacy and foresight was being wantenly destroyed by a group of Chinese officials selling their country piecemeal to the Czar. Britain woke up with a bang.

Hardly had the ink dried on this astounding contract, when the Chinese officials capped this piece of diplomatic stupidity by handing over to another Belgian syndicate, leagued with Russia, the concession for a through north and south trunk line connecting Tatung on the Mongolian border with the city of Chengtu, the provincial capital of Szechuan, commanding the natural passes from China into Tibet from the east. At Chengtu the Russo-Belgic combination at last linked up with the lines of their French partner from the south. The dream of Empire was being realized. Mongolia had been cut away from China, and hurried steps were being taken to solidify the Russian position by means of new railways that would bring the armies of the Czar down to the exposed western flank of Japan in south Manchuria. China was cut in half from east to west by a line that would run from Central Asia to the sea at the mouth of the Yangtze, paralleling the northern borders of Tibet and creating a southern military boundary for Mongolia. From north to south China was split in twain by the Tatung-Chengtu-Yunnan-Yamchow combination commanding the principal roads and passes into Tibet from the east and north-east. This line would bisect the east and west line and the two merge into one in the fertile Wei River Valley, the cradle of China's civilization. Sianfu, the ancient capital of China, would become the central base of future Russian operations. The implements for throttling British rule in India, through control of Tibet had been forged. At every step China faithfully adhered to her alliance with Russia surrendering the use of her territory to menace the position of Britain in India and exposing Japan to the mercy of the Czar. Is it any wonder that Japan and Great Britain came closer together for the protection of their common interests?

Great Britain had no choice left to her. She closed the Yangtze. She announced her intention so that all the world might heed the warning. There was no mistaking the words of Sir Edward Grey in his memorable speech before the House of Commons on July 10, 1914. The United States government had refused to go beyond words in its interpretation of the Open Door. With Britain it was a matter of life and death, and no matter how willing she was to open the Yangtze Valley to all, the action of the Chinese government in inviting the Russians south of the Great Wall and endangering the existence of the British Empire, compelled her to discard ideals before the stern necessity of self-preservation.

China had placed herself in the jaws of a giant Russian nutcracker; she sold her birthright in Manchuria, Mongolia and Hsinkiang to achieve her revenge upon Japan. She had become a menace to herself, a formidable danger to the existence of others. When Britain announced that the Yangtze Valley was closed, France understood that the play was over and hurriedly slammed to the door in Kwangsi and Japan later presented the Twenty-One Demands in order to consolidate her position in Manchuria and Inner Mongolia.

Not only were India and Tibet menaced by the Belgo-Franco-Russo strategic railway system, but by Russia's occupation of Mongolia, Japan's position on the mainland became absolutely untenable. Reference to the map will clearly show that the main Belgo-

Franco-Russo lines all debouched upon Shantung, enclosing that province and Peking in a Russian trap, handing over to the armies of the Czar all the territory north of the Yangtze Valley.

We can now understand Japan's determination to oust Germany from Shantung. If Japan had remained neutral or semi-quiescent, Russia sooner or later, would have insisted upon the right to lay siege to Tsingtao from the land side, sending her troops through Chinese territory for that purpose, or, in the event of an Allied victory with Japan on the outside, Russia would have claimed the German rights in China which would have provided her strategic railways with a fine ready-made deep-water terminus at Tsingtao, instead of Tungchow on the Yangtze. Under such conditions, Great Britain would have been compelled to yield the point to save her position in that region. It meant another step forward for the Bear in Asia. The Central Asian Lung-Hai-Tatung-Chengtu system would have found its northern outlet to the sea over the rails of the Russo-Franco Chengtai line, and thence over the German Shunteh-Tsinan and Shantung railways to Tsingtao. The terminus of the Lung-Hai line would have been diverted to Tsingtao over the German Kaomi-Hsuchow project.

With Russia entrenched in Mongolia and northern Manchuria and heir to the German rights, Japan would have been surrounded and compelled to withdraw from the mainland and take her last stand, make the last fight for her existence, in Korea or the Japan Sea. It is rather tiresome to read Chinese and foreign surmises as to the reasons which prompted Japan to enter the war and attack the German stronghold at Tsingtao. She had no choice in the matter. An Allied victory with Japan on the outside meant the domination of Shantung and north China by Russia. Japan did the proper thing. Instead of heaping abuse upon the heads of the Japanese military leaders and accusing them of entering the war for territorial expansion in pursuit of a set policy of imperialism, we should acknowledge the superior military genius of men who knew best how to safeguard the existence of the empire entrusted to their keeping. Militarists have no ideals. Their duty is to defend the nation and lay plans far in advance for any possible contingency.

The players were keenly intent upon their game during the war. Great Britain has taken advantage of exceptional opportunities to drive her frontiers and influence deep into Central Asia against the day when the Bear will once more start upon his devastating march. Democracy may prevail in Russia; again, it may not. Britain is taking no chances in a game that has been going on for over a century. There is no assurance that Russia will not take it up where she left off. The weak spots in the defense of India have been strengthened. Persia is another Egypt under the protection of Great Britain. She pays the penalty for refusing to place her house in order and provide protection to the British Empire.

Immediately following the ratification of the Persian treaty, on August 18, 1919, came the announcement that Great Britain and China reached an agreement in regard to Tibet. The Chinese Foreign Office agreed to grant autonomy to Tibet while retaining suzerainty over that country; and the proposal met with the approval of the British government. China will be relieved of the burdensome and hitherto impossible task of keeping Tibet in order; and the British desire for the maintenance of Tibet as an autonomous buffer state is realized. In other words, Great Britain finally counter moved against Russia in Mongolia, applying the identical tactics. Tibet is declared an autonomous, independent state under the suzerainty of China, and, on the side, Britain has separate understandings with Tibet which places the newly created state under her protection. Just like Mongolia, the same as Persia yet not a note of protest from the Chinese.

In the east, Japan was desperately trying to hold down the situation and extend her foothold in northern Manchuria, Mongolia and Siberia. She has taken advantage of every opportunity

to fortify herself, and extend her front line trenches as near as possible to the coming menace. What could not be done with shovels and trench tools, was accomplished with gold. Russia got a taste of her own medicine; her methods were turned against her; Japan purchased every right the Chinese mandarins would part with.

Japan did what any other nation placed in the same position would do under the same circumstances. The Northern and Southern leaders were on their knees begging Japan for ready cash to fight each other with. The Northern, or militarist government, was recognized by the Powers; it had the power to contract loans and hypothecate rescurces. Japan went the limit in obtaining control over rights deemed essential to her future security against the "come-back" of Russia. She did her work well. She confirmed her strategic position in Manchuria and Inner Mongolia by a definite railway agreement and paid down \$10,000,000 bargain money to clinch the deal. She loaned funds for the Peking-Kalgan-Suiyuan railway and obtained an option on the future financing of this strategic line of the Inner Mongolian defenses. She outwitted Russia, planting herself squarely across the path of the Bear. Russia played a magnificent stroke when she separated Mongolia from China and outflanked Japan's position in south Manchuria. Japan has quietly, impatiently at times, awaited her opportunity and repaired as far as possible the damage caused by China's weakness.

The struggle for empire, for the right to live and exist is still going on within the hidden confines of Central Asia. There is no power or combination of Powers that can dislodge Japan from her position. She will fight to a finish and go down to oblivion before she will again leave the door open and the road clear for the Bear to walk through. It is time for Americans to wake-up and face the realities of the situation. Instead of heaping abuse upon Japan for protecting herself against attack, Americans should applaud the genius of statesmen who directed the moves, in the same manner, that, in the past, they went into rapturous admiration over the marvelous advance of Russia, and insist upon the application of the same policy where their own interests are concerned.

Judge Gary Denounces the Warmakers

NEW York, December 16—Judge Elbert H. Gary, President of the United States Steel Corporation, speaking at the annual dinner of the Japan Society here, denounced what he termed the vicious and deliberate efforts to foster trouble between the peoples of the United States and Japan. Should there be a clash between the two countries, he said the people of the United States would be more to blame than the Japanese.

Judge Gary asserted that he likes to trust the honesty and integrity of the Japanese, and that they are building warships as a last resort against an attack without reason.

Baron Shidehara, the Japanese ambassador in Washington, and Mr. Roland S. Morris, the American ambassador to Japan, were among the guests. Mr. Morris remarked that Baron Shidehara and himself are working together at Washington, not negotiating a new treaty, but, with the consent of their respective governments, they had discussed frankly and fully certain questions which had arisen between the two countries, trying to understand each other's point of view, and striving to find a solution which they may submit for the consideration of the two governments. They are doing this, said Mr. Morris, confident in the belief that there are no questions which, approached in a generous spirit of candor, are not susceptible of an honorable solution, giving evidence of the friendly feeling between the two peoples.

Lung-Tsing-U-Hai (Lunghai) Railway Agreement

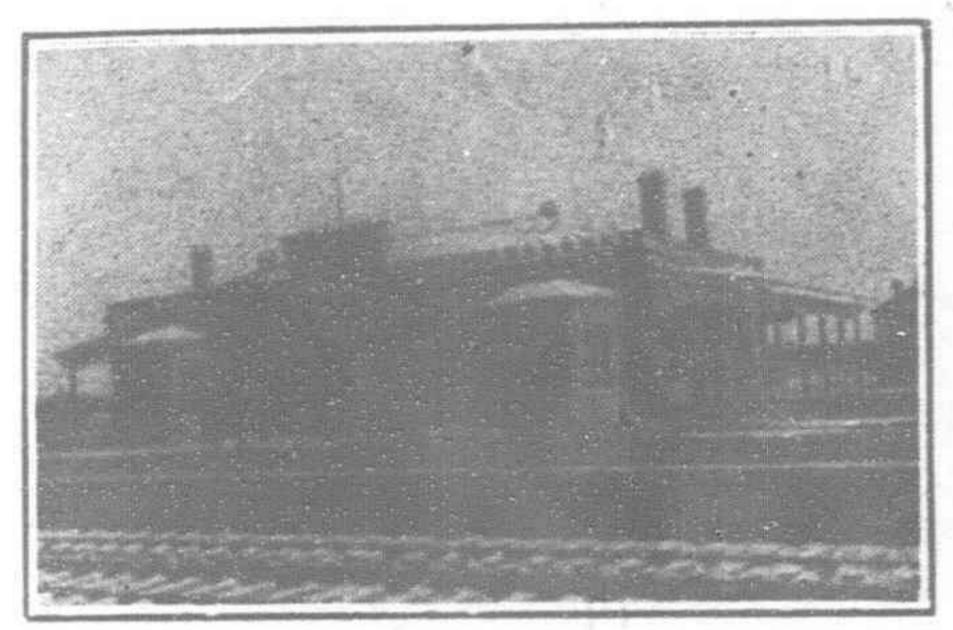
The following is the complete text of the Lunghai Railway agreement:—

HIS Agreement was concluded at Brussels on the first day of May Nineteen hundred and twenty:—
The Contracting Parties are: (1) His Excellency Mr. Sao Tseng-sze, general manager of the Lunghai Railway (Lung-Tsing-U-Hai), acting for the government of the Chinese Republic, by virtue of its authority, on a special mission which has been entrusted to him by his government, in the first part. (2) The General Company of railways and tramways in China, Belgian Anonyme Societe, head office Brussels,

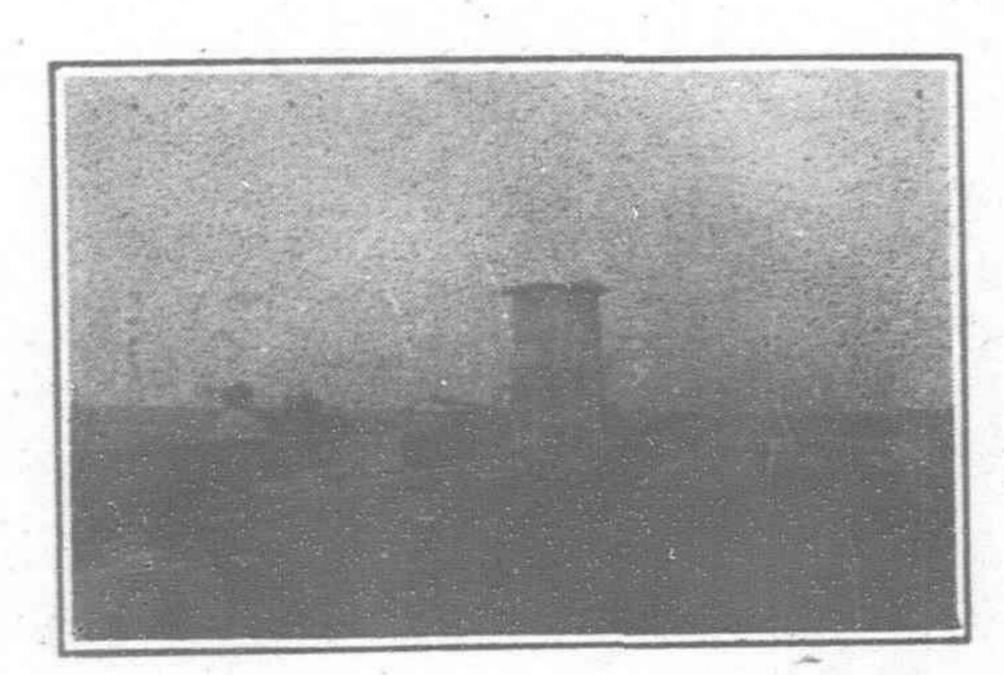
HIS Agreement was concluded at Brussels on the first day of May Nineteen hundred and twenty:— the General Company and the Netherland Syndicate to issue more The Contracting Parties are: (1) His Excellency Mr. agreement (Art. 1 above) the Chinese government will authorize the General Company and the Netherland Syndicate to issue more money.

(4) All the loans which will be issued by the General Company and the Syndicate Neerlandaise by virtue of articles 2 and 3 above, will be to the regime of this present agreement, except those of interest, length of redeeming, and issue conditions, which will be fixed specially for each issue.

(5) This loan will be governed by the agreement of the 24th



Lotung Railway Station at Honanfu



R. R. Yards at Honanfu, Lotung Railway



Lotung Trestle near Honanfu

represented by M. François Empain and M. Jules Jadot, Administrators, called the General Company, in the second part. (3) The Nederlandsche Maatschappi Voor Havenwerken, Societe Anonyme Neerlandaise, head officer Amsterdam, acting in its own name and for the Dutch group called the Netherland Syndicate for China, represented by Mr. Robert de Vos, duly accredited and called "The Syndicate Neerlandais," in the third part.

1. The contracting parties engage themselves to co-operate on the following conditions and reservations, to carry out the loan contract of the 24th September 1912 between the General Company and the Chinese government for the construction of a railway from Kansuh to the sea and a marine port.

This co-operation will be limited to the marine port, and to the section between the sea and Sanchow, or such neighboring points of Sanchow on the Yellow River up to the rapids of Sanmen which will be chosen as the terminal point at the west. Its ramifications can be extended only in the event of a new agreement being made, to the section to be built on the western point connecting with the Yellow River.

2. The General Company and the Syndicate Neerlandaise are in charge to issue the loan for the Chinese government, which will be necessary for the carrying out of the work, the ordering of material, the financial service and the re-imbursement of the loans already issued or to be issued.

3. From now on it is agreed that: (1) The General Company is authorized to issue at different periods a nominal total of 150,000,000 francs, the half at least is to be used for the west section, between the actual terminus (Kwang Yin Tang) and the Yellow River, or for the loans required during the construction of this section.

(2) The Syndicate Neerlandaise is authorized to issue at three periods the nominal amount of 50 millions Netherland florins, of which half at least is to be used for the port and section between Tsinpu and the sea.

(3) If the amount is not sufficient for the object of the present

September 1920 (with any changes which would meet with the approval of the Syndicate Neerlandaise) except the special explanatory complete or subsidiary conditions mentioned in this present agreement.

They will be placed in every respect in the same category as the loan issued in 1913 and the treasury bonds issued in 1916 and 1919. They will have all the rights, privileges and guarantees as the agreement of 1912 recognizes to the loan, specially the regime established by the agreement of 1912 for construction, exploitation, use of funds, and other debts, will be applied to the loans issued by virtue of the present agreement.

(6) In the general interests of the railway, the principle of unity of the Lunghai enterprise is to be maintained. The principle direction and the general interests of the foreign interests will be entrusted to the General Company, without prejudice of right or claim, which will occur from the execution of the present agreement.

(7) In what concerns the division of the railway at the east of Tsinpu and the marine port, a special regime will be established by virtue of which the foreign employees engaged to work there will be engaged by the Syndicate Neerlandaise. These employees will be placed under the orders of the chief engineer, who will entrust the discipline and work service to the chief of the eastern service.

The chief of the eastern service can only be dismissed in the interests of the company and with the agreement of the Syndicate Neerlandaise.

(8) Technical work to be made in Europe for the eastern division will all be performed by the company general in matters concerning the railway line, but the work relative to the construction of the port will be entrusted to the Syndicate Neerlandaise at Amsterdam. Although it is only a provisional question of constructing a western line—the survey of the port will be taken up again as soon as possible.

(9) The construction of the port will be given to the contractor chosen by the Syndicate Neerlandaise and carried out according

to the plans and specifications approved by the chief engineer and the general management of the railway.

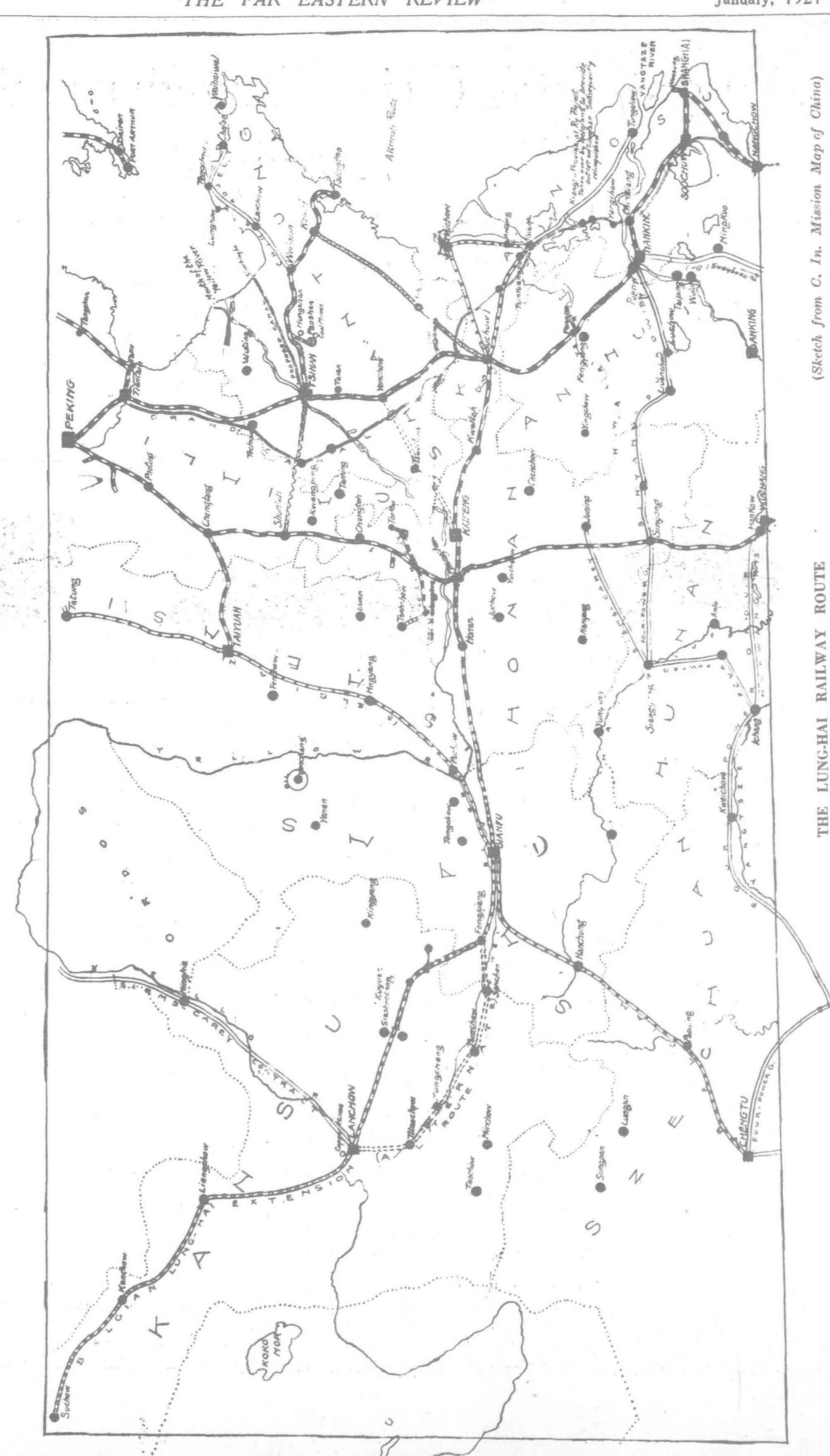
(10) The port will be built by contract. The price of the contract must be submitted by the chief engineer to the general manager and approved by him as soon as possible after the plans and specifications are finished. The Syndicate Neerlandaise will be admitted to the discussion of the contract.

(11) The orders for supplying the division west of Tsinpu will be the same as the contract 1912, giving preference to Belgium and France. When the factories of the above countries are unable to furnish, the preference will be given to Dutch interests through the Syndicate Neerlandaise.

For the supplies of the division east of Tsinpu and to the port, the General Company will rely upon the Syndicate Neerlandaise who will give the first preference to Dutch industries, after to French and Belgian.

The colonies will be assimilated to their motherland. The factories in foreign countries with Belgian, French and Dutch management will have the preference over other foreigners.

(12) According to Article 13 of the contract of 1912, the Syndicate will put the net amount of the bonds at the disposition of the railway Lunghai, and they will open a current account at Amsterdam named "Government Chinois-Chemin-de-fer de Lung-Tsing-U-Hai." The railway can draw from this account according to their needs with the consent of the General Company and the Syndicate Neerlandaise.



The total credit of this account will carry an interest of 3 per cent. per annum to the benefit of the Lunghai.

(13) In order to repay the interior loan the sum of \$1,800,000

(Mex.) can be withdrawn from this account.

(14) An ample provision will remain in the hands of the General Company and the Syndicate Neerlandaise to assure the financing of the loan up to the first of July 1922, to cover the expenses of the survey of the port, to pay for material, and other expenses in Europe.

(15) The General Company and the Syndicate Neerlandaise respectively will issue immediately the first portion of the loan as

per Article 3.

These bonds of a nominal value of fifty million francs, and sixteen million six hundred and sixty-seven thousand florins (Netherland) respectively, will be represented treasury bonds of the Chinese government carrying 8 per cent. interest yearly to be paid half-yearly, re-imbursable at par by one-fifth of the issue yearly, to begin from the sixth year and to terminate at the end of the tenth year. The anticipated re-imbursement can only take place

in the case of a cancel of this agreement (see Art. 18).

million nominal and the Syndicate Neerlandaise buy firm at the price of 91 per cent. the 16,667,000 florins (Netherland) nominal, as soon as the notifications foreseen by Article 19 has been made. The General Company and the Syndicate Neerlandaise will place at the disposal of Lunghai, a third of the amount respectively. The whole amount will be placed at the disposal of Lunghai within a period not longer than forty days after the notifications. However if the notification has not been made on the first of June 1920 at the latest, the General Company and Syndicate Neerlandaise will be exempt from any engagement to buy firm any of the bonds at 91 per cent.

(17) The Syndicate Neerlandaise will not be obliged to issue before the first of July 1922, the second third of the loan (see Article 3) neither before the first of July 1923, the last third. If at the expiration of these periods these issues have not taken place on account of the political or financial situations, the Chinese government and the General Company will grant to the Syndicate a

reasonable period of prolongation.

(18) If this extension of time passes without the Syndicate Neerlandaise being unable to issue, this present agreement will be null and void as soon as the issues and advances made by the Syndicate will have been repaid with interest up to date.

(19) The Wai-Ciaopou will notify the ministers of Belgium, France and Holland in Peking, of this present agreement. Moreover the Wai-Ciaopu will notify the minister of Holland the agree-

ment of 24th September, 1912 and its particulars.

(20) In case of disagreement on the subject of interpretation or application of this present agreement, the difference will be settled by a court of arbitration composed of two arbitrators, presided over by a referee. An arbitrator will be chosen by each of the two parties, viz.: The General Company and the Syndicate Neerlandaise for one part and the Chinese government for the other part. The referee will be chosen before the beginning of the contest by the two arbitrators.

Made in three copies at Brussels on the first day of May 1920. For the Chinese Republic: The General Manager of the Rail-

way for Lung-Tsing-U-Hai.

For the General Company of Railways and Tramways in China: Two Administrators.

For the Nederlandshe Maatschappi Voor Havenwerken: Power of Attorney.

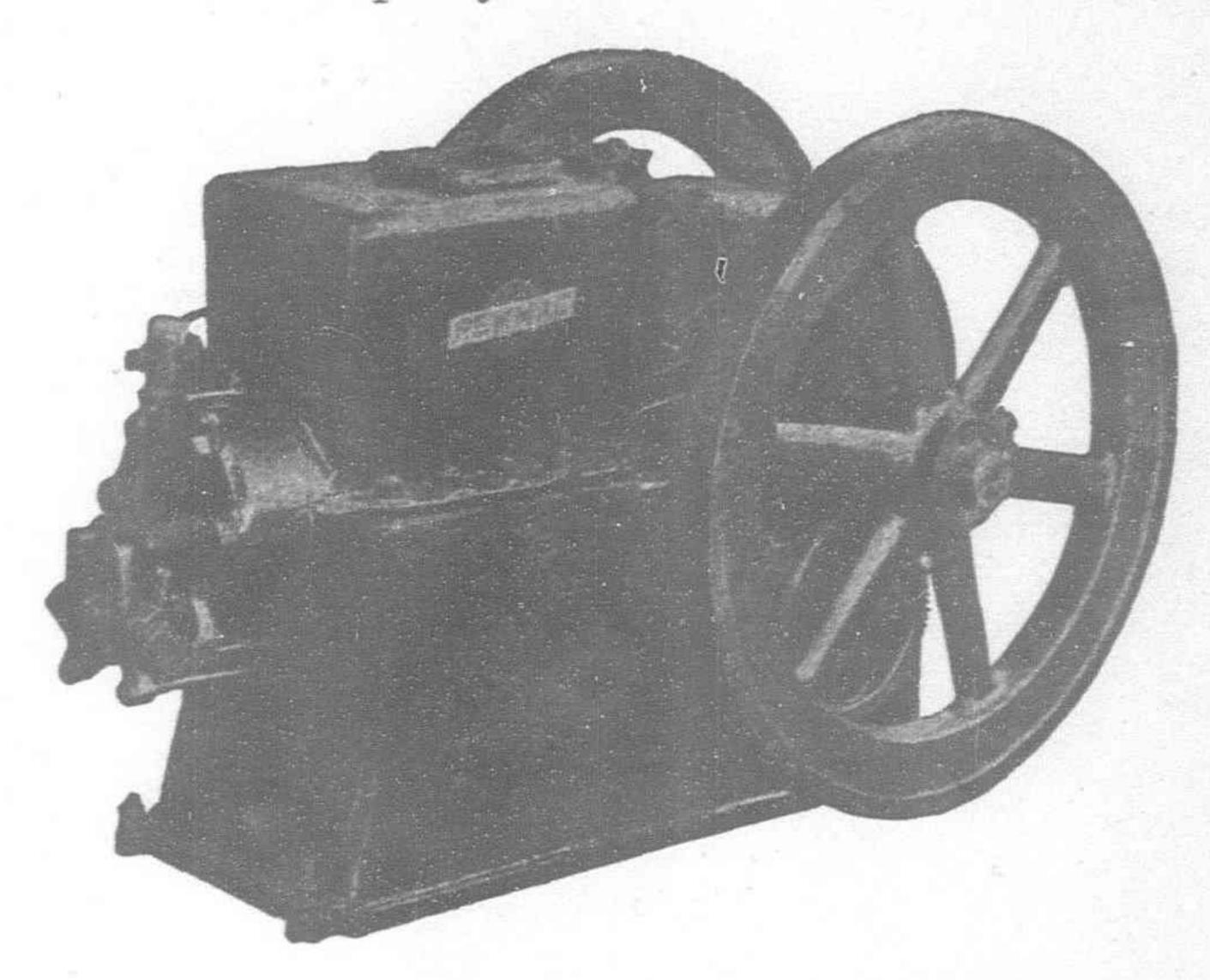
SHANGHAI EXPOSITION IDEA REVIVED.—Since his return from the United States, Mr. Y. T. Nieh, Chairman of the General Chamber of Commerce of Shanghai, has revived the idea of holding an international exposition at Shanghai. Conferences are proceeding, but no definite plans have been made.

Simplicity in Oil Engines

BELOW is shown an illustration of the Permac oil engine, one of the latest and most interesting American engines that have appeared on the market in recent years.

The Permac is a small oil engine designed chiefly for agricultural and small industrial power purposes. At the present time, it is made in 3 H.P., 6 H.P. and 8 H.P. sizes, but larger and smaller models will be added from time to time.

The most striking feature of the Permac is that it starts and operates on its own compression, and on the same fuel (kerosene, distillate, fuel oil), and has no ignition devices of any kind (no carburetor, no magneto, no battery, no wiring, no spark plug, etc.) Therein lies its greatest advantage over the gasoline engine. It has long been recognized that 80 per cent. of all engine troubles are due to faulty ignition, and that this has proved to be the greatest obstacle to the widespread use of gasoline engines. By eliminating all these ignition devices, the Permac will go a long way towards satisfying those who demand a prime mover whose cardinal feature is simplicity.



Another feature of the Permac, and equally as important, is its ability to operate on paraffin (kerosene) distillate, fuel oils or any of the low-grade oils. It does not operate on petrol (gasoline). The ever increasing price of gasoline and the great difficulty which many countries have experienced in procuring this product, have greatly added to the operating cost of gasoline engines. On the other hand, crude oil is found abundantly in many parts of the world, and there is no doubt that the Permac will be able to reach out into many fields where the gasoline engine is practically barred.

Operation.—The Permac is a high-compression four-stroke cycle engine and ignition of the fuel is automatically caused by the heat generated by the compression of the air in the cylinder.

The fuel injector is set into the cylinder head and has on the lower end a cup which projects down into the combustion space and which has in it some small holes pointing toward the piston.

On the suction stroke the fuel feeds by gravity past the needle valve, controlled by the governor, and the fuel valve into the cup.

On the compression stroke the air in the cylinder is forced into the combustion space under a pressure of about 450-lbs. which gives a temperature of about 1000° F.; entering the cup through the small holes the hot air causes the fuel in the cup to "flash" and it blows out in a fine spray through the holes into the combustion space where it burns and forces the piston on the power stroke. The piston returns on the exhaust stroke and the cycle is complete. The speed and power of the engine are controlled by the amount of fuel fed past the needle valve.

Although the Permac has been on the market for a comparatively short time, it has already aroused considerable interest in many parts of the world, and many orders have been received from the Philippine Islands, New Zealand, India, Straits Settlements, Japan, Great Britain, Argentina, Peru and other countries.

American Gold Dredge in Korea

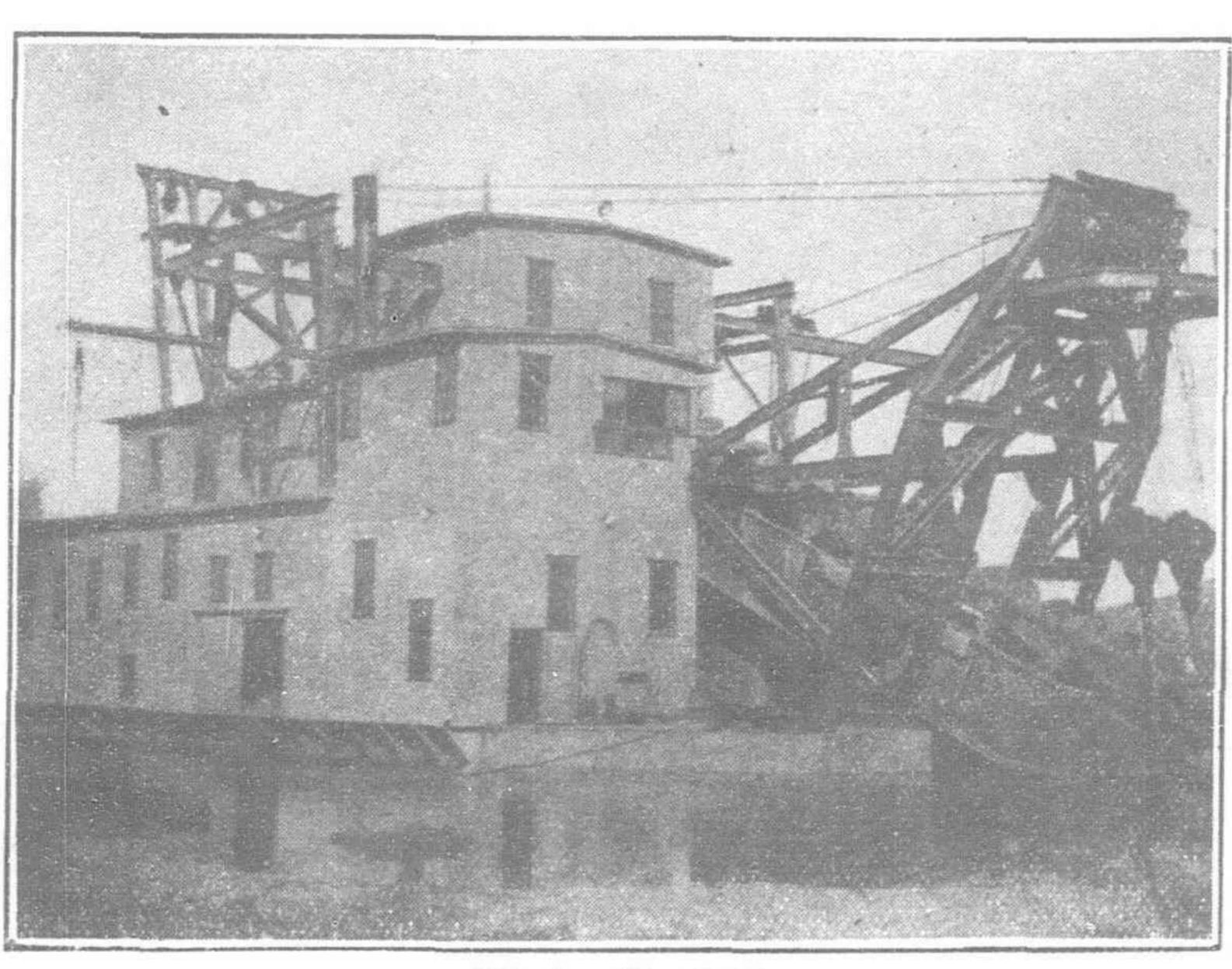
HE Chiksan Mining Company, whose shares are largely held by Americans and Japanese, decided a few years ago to place dredges on their placer properties, and after careful preliminary prospecting, in the course of which several thousand drill holes were sunk, a modern, all-steel dredge was purchased from the New York Engineering Company.

The installation consists of a 500 k.w. Power Station located at Seikwan, a town on the Seoul-Fusan Railway, 50 miles south of Seoul, a high-tension transmission line extending about six miles to the

dredger area at Chiksan and the dredger.

The Power-house consists of three Babcock and Wilcox boilers for 200-lb. pressure, automatic stokers, Green economizer, Curtis General Electric turbine and Wheeler condenser. The plant is especially designed to fit in with an additional unit when required.

A high-tension transmission line carries the current at 22,000 volts to a



Digging Top Soil

point within a mile of the dredge where it is transformed to 22,000, the voltage used by all motors on the dredge.

The dredge is all steel, and has a digging capacity of 25 feet below the water-line and will carry a bank 15 feet above water and can handle over 150,000 cubic yards per month.

This dredge has an over-all-length from tip to tip of 230 feet. The hull is 110 feet long, by 50 feet wide, by 10 feet deep, and has an overhang of 3 feet on each side, giving a deck width of 56 feet. The total weight is 1,300 tons.

The forward gantry is built up of 14, 1-inch beams capped with a 20.1-inch beam and has a height above deck of 43 feet. The main gantry is also

built of 14.1-inch I beams and has a height of 31 feet, while the rear gantry is 63 feet high and built of 12-inch H beams.

The digging ladder is 80 feet long, of the box girder type, and carries a bucket line of 62 manganese steel buckets close connected. The capacity of each bucket is 11 cubic feet; weight 2,400 pounds. These travel on manganese steel rollers, spaced six feet apart. The lower tumbler, 80 inches in diameter, weighs 9 tons and is of manganese steel. The lower tumbler shaft is hollow, chrome vanadium steel 14 inches in diameter. The upper or drive tumbler is hexagonal in shape, of solid manganese steel and weighs 11 tons. Its shaft is 22 inches in diameter by 11 feet 6 inches long, driven by double gears each 12 feet 6 inches in diameter by 10-inch face which are in turn driven by a double set of reduction gears forming the main drive. The entire weight of the bucket ladder, with rollers buckets and lower tumbler, is about 150 tons.

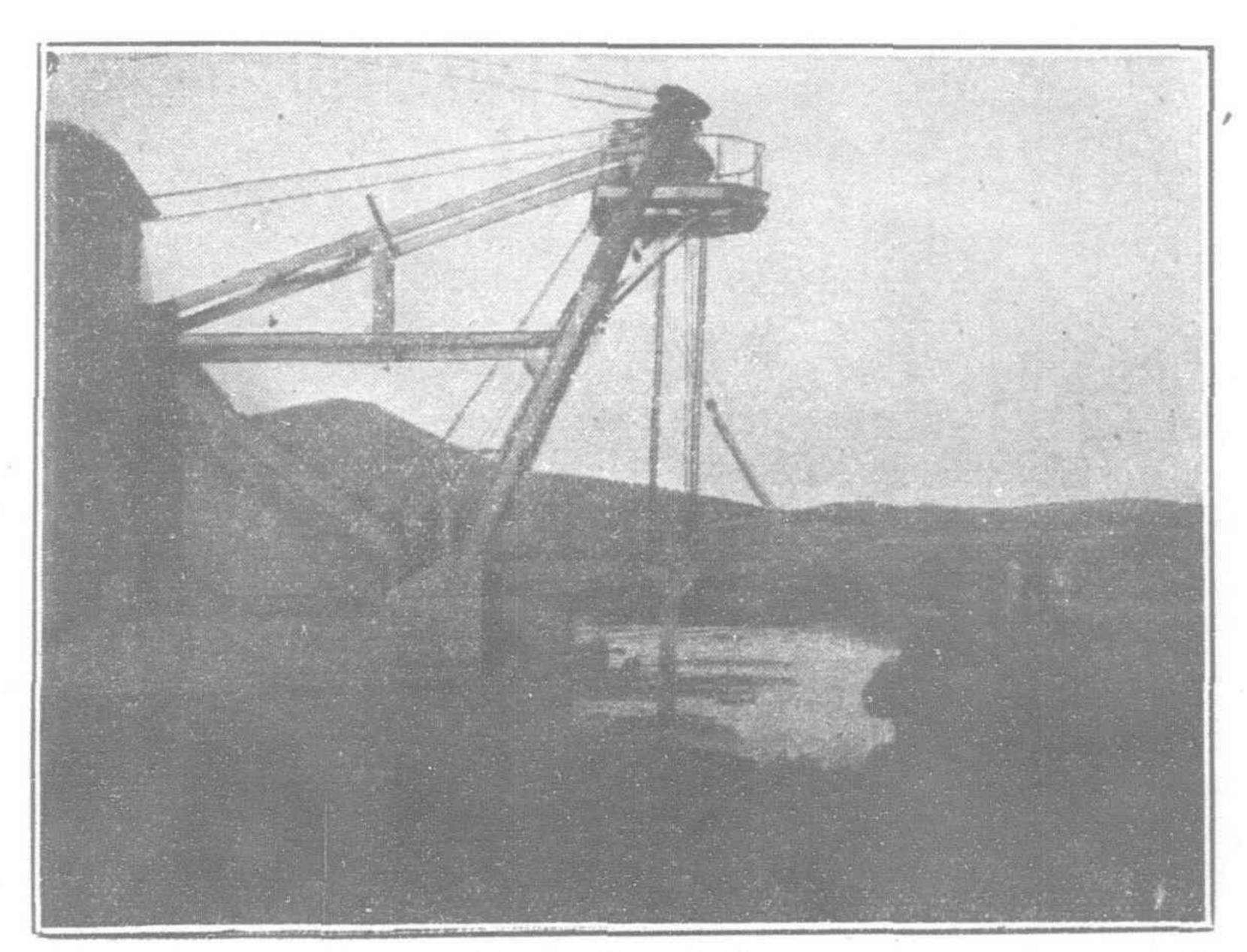
The motive power for the bucket

line is furnished by a 200 H.P. 2,200 volt A.C. motor. This is so arranged as to be used for both hoisting the bucket line and digging.

The buckets discharge through a manganese steel hopper provided with manganese steel wearing plates into a screen 84 inches in diameter by 46 feet long driven by a 60 H.P. motor. This screen is so arranged that when rotated in one direction it forces the barren material on it without it going through the meshes, and when revolved in the other direction retarding rings hold the material in the screen until the fines are forced through by water pressure. This is designed particularly for reclamation purposes.

Material discharged from the screen is either washed to the pond some 30 feet from the storn or led into a belt conveyor which discharges 100 feet in the rear.

The gold bearing material washed through the screen is distributed on



Digging Bed Rock

the gold saving tables having an area of 5,000 square feet and equipped with Hungarian type riffles.

Two spuds of the box girder type, 27-in. by 42-in. is section and weighing 17 tons each are provided for digging, and in addition a one and three-eight inch cable 1,000 feet long, is provided for a headline when it is wished to use that method.

Water is furnished by three centrifugal pumps direct connected to 2,200 volt motors. The sizes are 4,600 gallons per minute with 60 foot head and a 125 H.P. motor, 6,000 gallons per minute with 25 foot head, and 75 H.P. motor and 750 gallons per minute at 150 foot head, and a 50 H.P. motor.

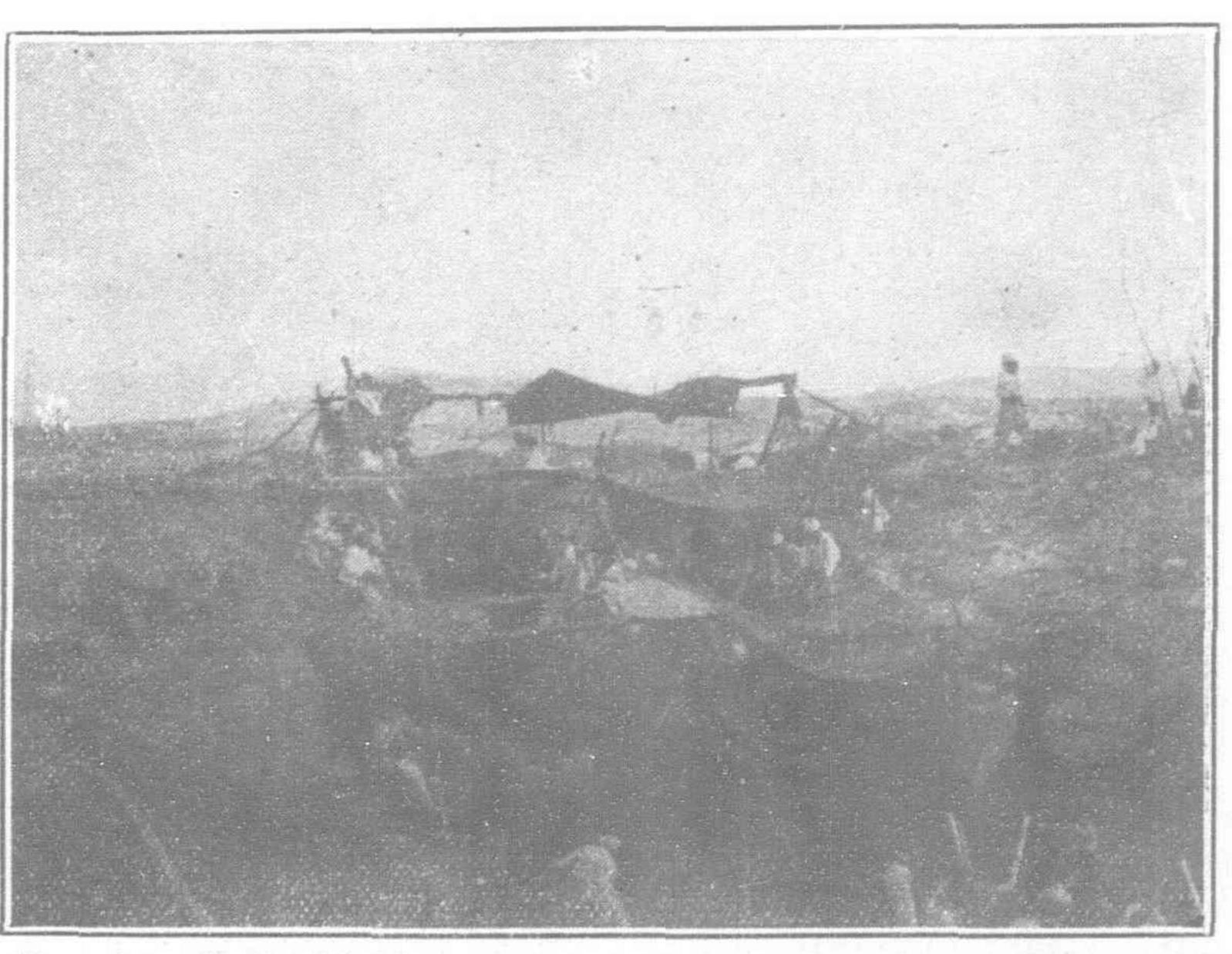
The main winch is mounted on the forward deck and carries 7 drums,

four for the corner lines, two for spuds and one for head line. The winch is provided with double reduction gearing which provides two speeds for each drum.

A complete system of levers is provided, and all operations are controlled from the pilothouse, which is mounted forward on the upper deck and provides an unobstructed view to all parts of the dredge.

A 60-H.P. boiler furnishes steam for heating purposes, and the hull is so heated as to keep the pond from freezing in the winter.

In addition to the gold content of the placer area, the existence of monazite sand has been proven. Monazite sand is one of the rare earths chiefly valuable for its Thorium content. The Company is carrying on experiments with a view to recovering this sand. Zirconium also occurs in the sands.



Pumping-Native Method, while installing Electric Driven Centrifugal to furnish Water for Dredge

Netherlands Indies Developments

NEW RAILWAY PLANS

HE government of Netherlands East Indies has made public an outline of the program for the extension and improvement of state railroads, tramways, and roads in the Netherlands East Indies for the next ten years. The plans for Java include: Double lines for those one of the routes where the traffic is most crowded: improve-

portions of the routes where the traffic is most crowded; improvement, extension, or rebuilding of important railway yards; new railroads in North Cheribon, in the Preanger residency south of

Bandong; in the south and east of the Preanger; in the residencies of Batavia, Bantam, Kedu, Kediri, Pasuruan, and Bezuki; altogether up to about 1,000 kilometers (kilometer-0.62 mile) of new railways.

The plans for Sumatra include: Completion of the south Sumatra lines, namely, the whole of the route from Oostenhaven (Telok Betong) to Palembang; from Muara Enim to Lahat and from there to the Bengkulen highlands; and in the Djambi direction up to Klingi territory; extension of the line from Lahat to Tebing Tinggi, Surulangun, Muara Tebo, Teluk, and on up to Muara Kalaban and Pakanbaru; a line also to connect Benkulen with the coast; in Djambi, a line from Surulangun through the oil fields to Muarabahar which will be the junction of six branch lines; a railway from Sibolga to Padang Sidempuan, thence extending to Penjabungan and connecting the Deli Railway with Pakanbaru; a line from Padang to Pasir Pengarajan by way of Lubuksikaping, and a line also from Padang into the Ophir district; altogether upwards of 2,700 kilometers of new railways.

The plans for Celebes are as follows: A line from Takalar to Macassar and Maros, this to be extended to Pare-Pare or Sungkang; a further extension from Pare-Pare along the gulf of Handar as far as Tubo; a

line connecting Palapo and Malili by way of Lowa, with extensions to the Gulfs of Tolo and Tomini, and branch lines to southern Boni and Takalala; in northern Celebes a network of railways in the Minahassa district; altogether upwards of 1,100 kilometers.

The plans for Borneo are as follows: A line from Pontianak to Samoas, with a branch line to Bankajang; a line from Pontianak to

Sarawak by way of Meraoe, with branch lines from Ngabang to Sanggar and Ngambang to Perigi; from Pontianak to Pematangtudju by way of Sungeikakap; from Bandjermasin to Tandjung by way of Martapura; and from Martapura to Pagatan by way of Pleihari; altogether upwards of 1,300 kilometers.

In Bali Lombok Banka and Billiton railways are projected up

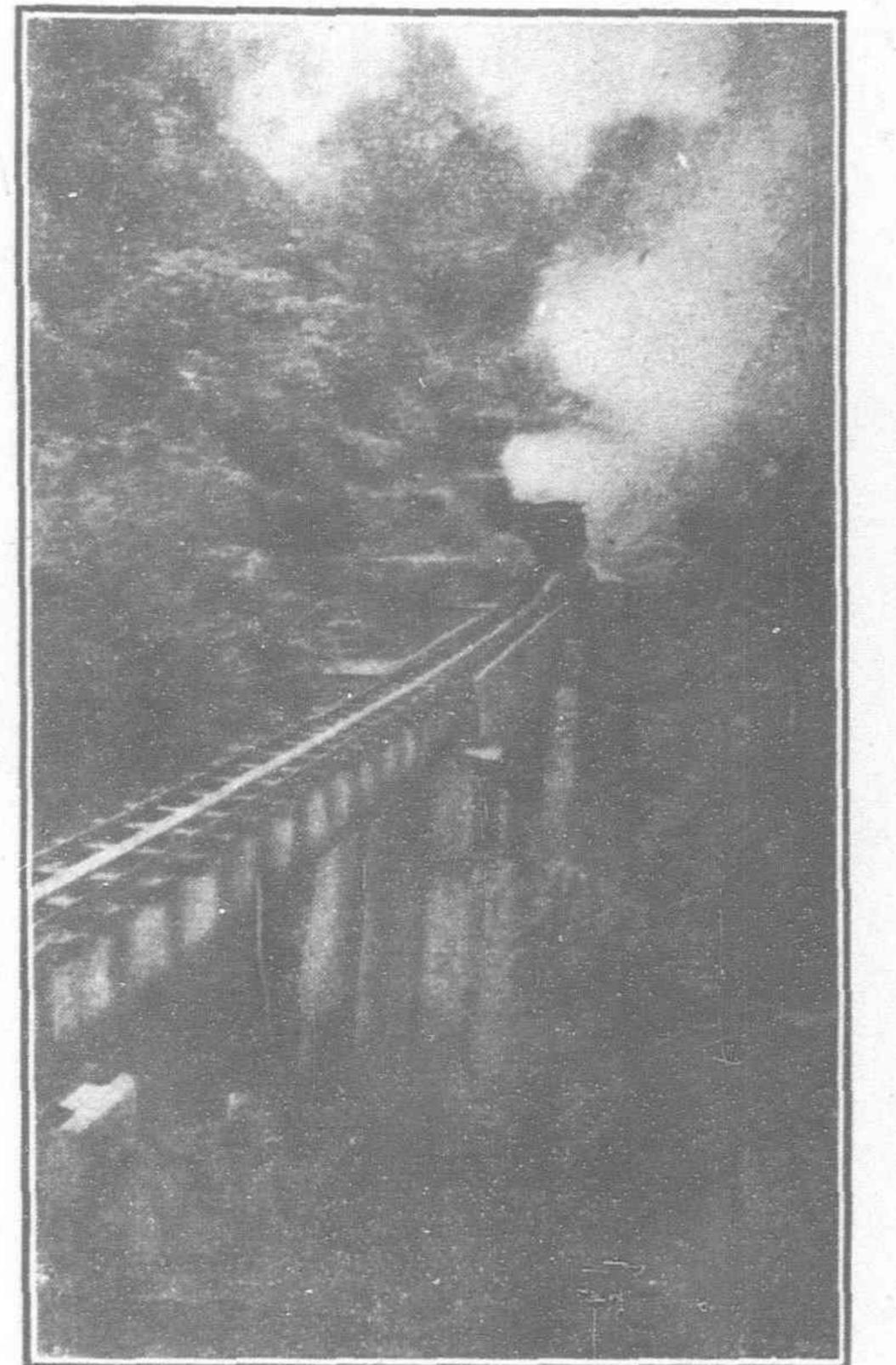
In Bali, Lombok, Banka, and Billiton railways are projected up to about 500 kilometers altogether. Plans for the whole of these lines are now in course of preparation.

Besides its railways and tramways, Java has a good number of fairly well-kept roads. The plans for these include the construction and improvement of two highroads running lengthwise across the island, with five side connections. These fit in with the district road plans.

The other possessions are badly off in the matter of inter-district communication. In the meantime, however, a general program for the construction of roads has been made for Sumatra, including plans for something like 54 roads, aggregating a total length of 4,600 kilometers. The intention is to connect those already existing and to open up new roads to outlying districts as far as necessary.

For Borneo, Celebes, Bali, and other islands plans for roads have also been devised and partly executed. Preparatory measures, too, are being taken toward improving the navigation of such rivers as serve as ways of communication.

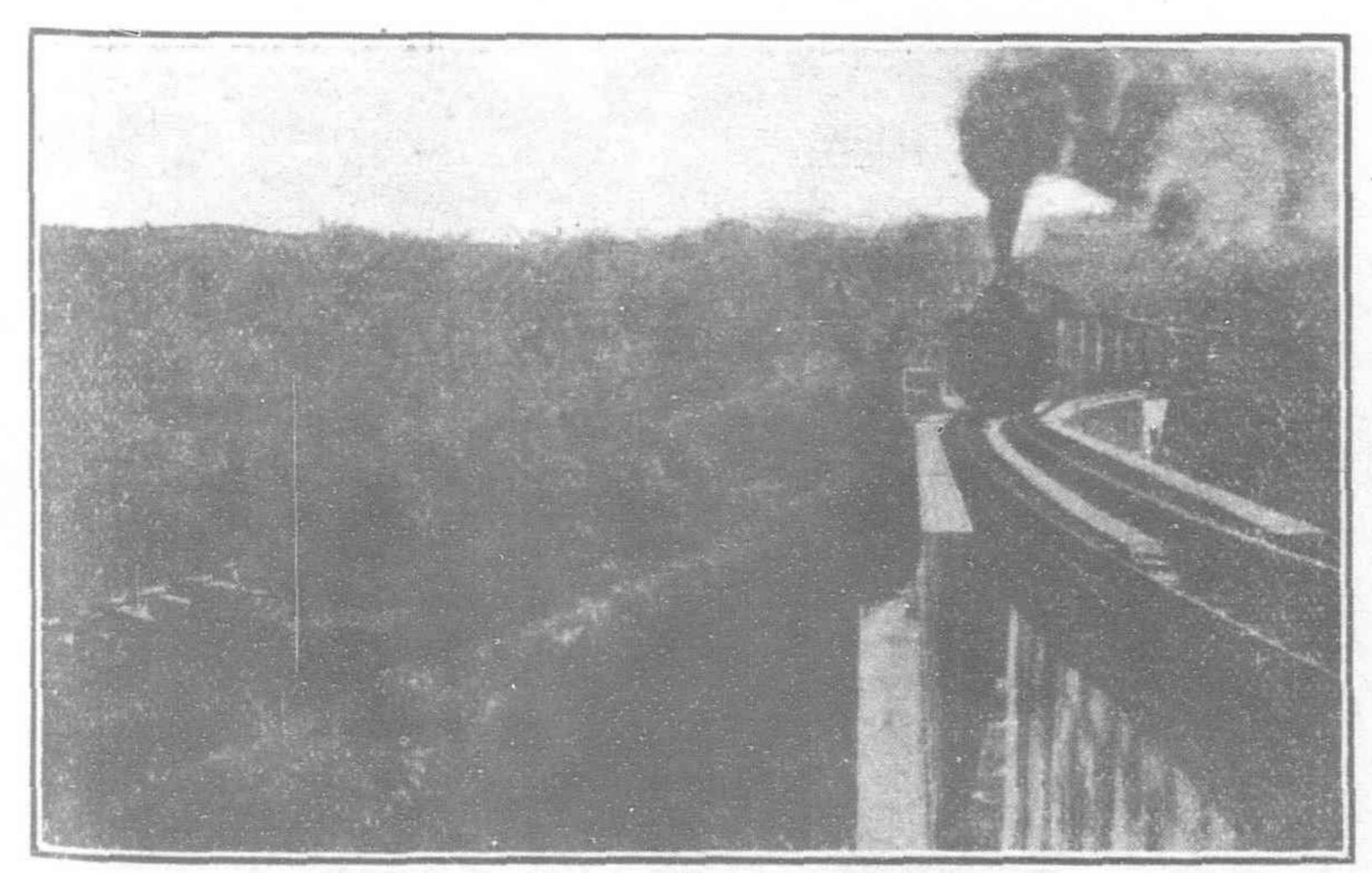
Much attention and energy is being devoted to the improvement of the means of communication in the other possessions. This will do away with one of the chief obstructions to the development on modern lines of the natural wealth of these places.



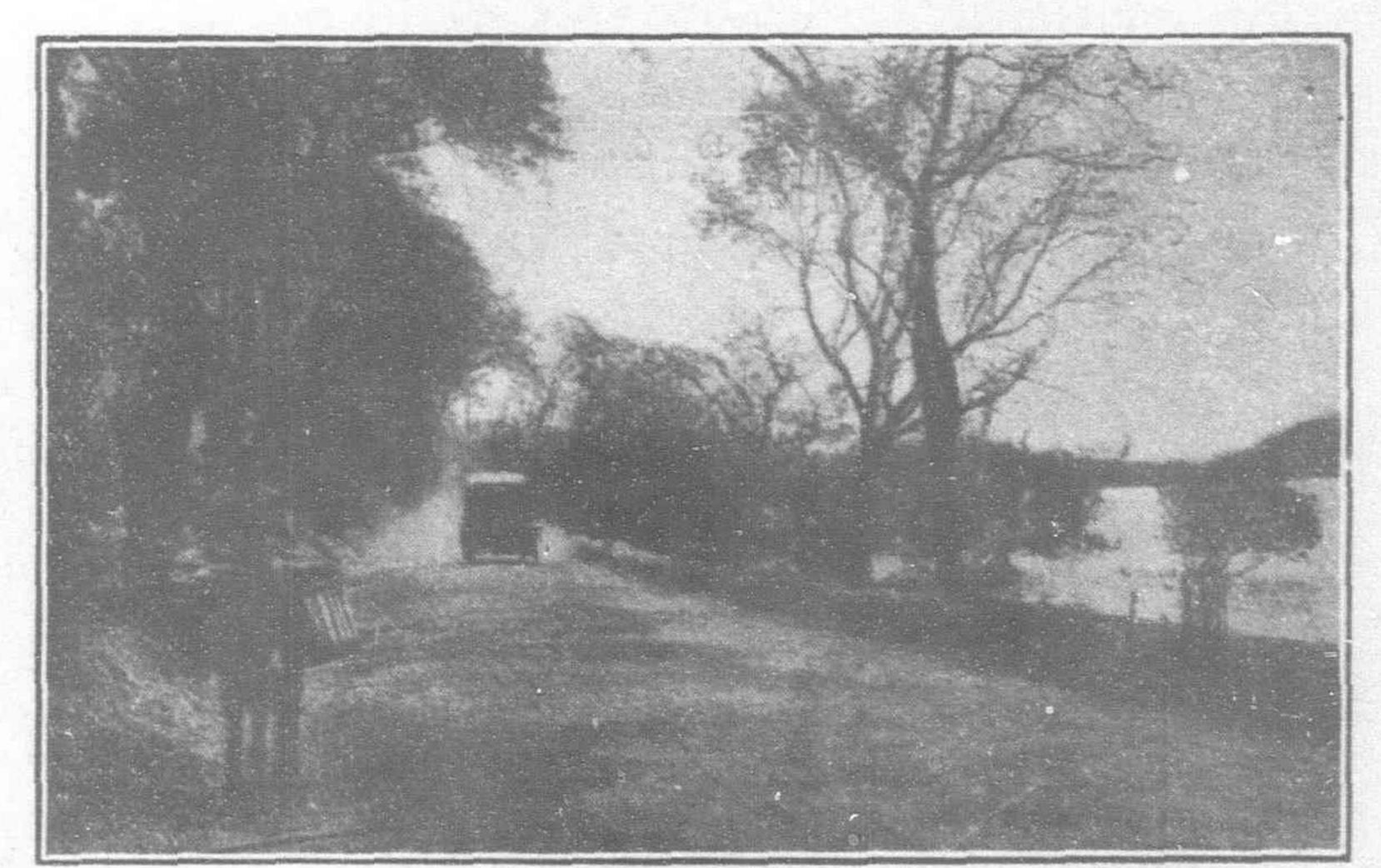
Railway Track Through Banjoewangi

Water Power in Netherlands Indies

During the next few years a tremendous amount of waterpower development is expected to take place in the Dutch East Indies. The government of the colony plans to install plants in Java and Sumatra, and possibly in Celebes, of sufficient capacity to supply

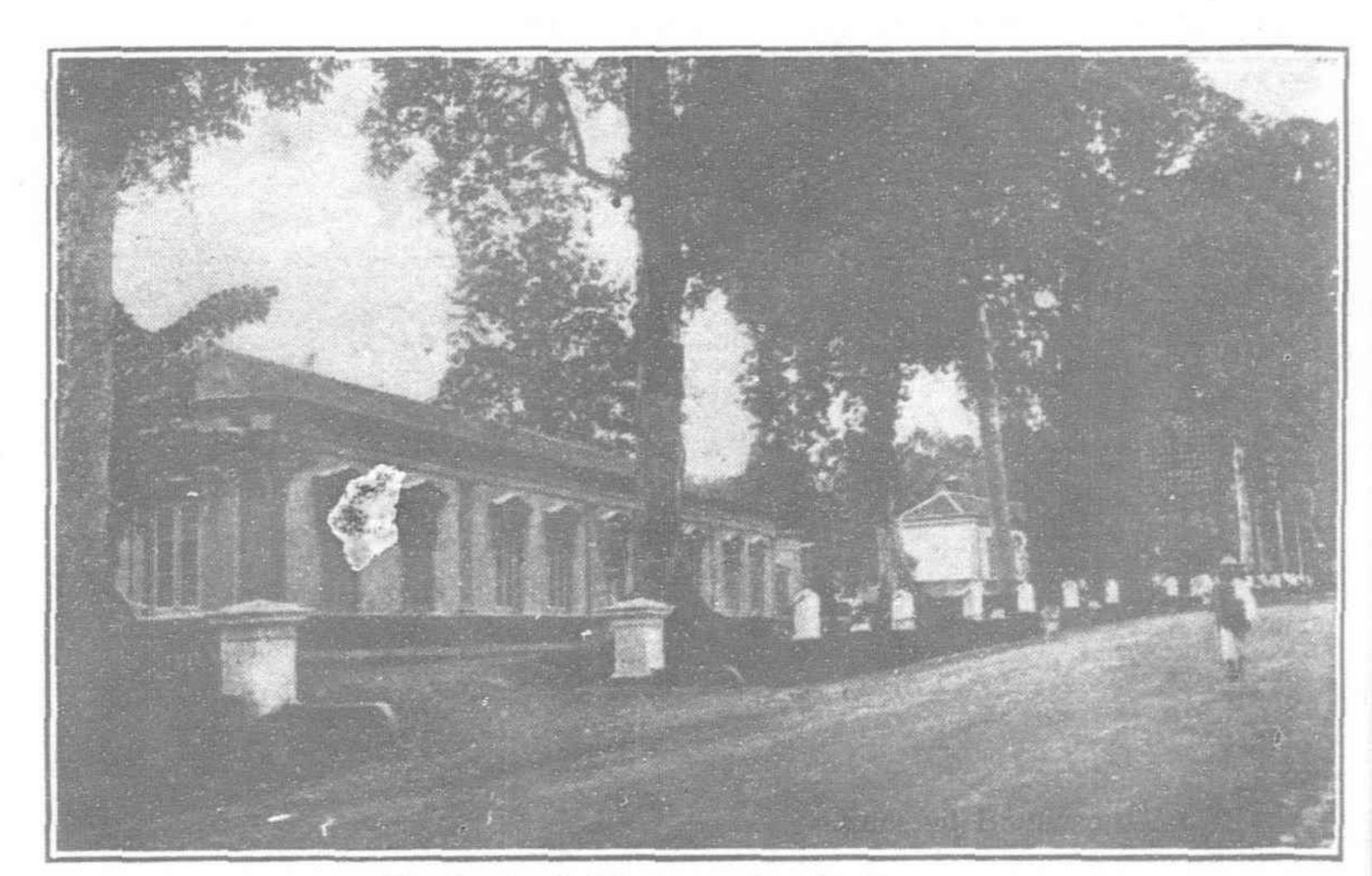


Railway Track Through the Preanger



Postal Road near Kraksaan

all the railroads w:th electric power, and several other schemes are now being projected with a view of supplying electric power for lighting the cities and towns and furnishing power for railways and factories. A recent survey of the waterpower resources of the islands states that on the island of Java 500,000 horse-power can be developed from the rivers; in Sumatra the Asahan River alone will develop a similar amount of power, and in Celebes, the Posso and Laa Rivers will develop 200,000 and 100,000 horse-power, respectively.



Zoological Museum in Buitenzorg

Preliminary plans have been adopted for various developments of this nature during the past year and in several instances the work of building dams and installing machinery has already been started. The rivers of Java are very short and are therefore not well suited for large developments. Because of the great difference in rainfall between the two monsoons and the lack of natural reservoirs or lakes, the majority of developments projected range between 1,000 and 2,000 horse-power capacity. During the rainy months this capacity can be increased by between 50 and 100 per cent.

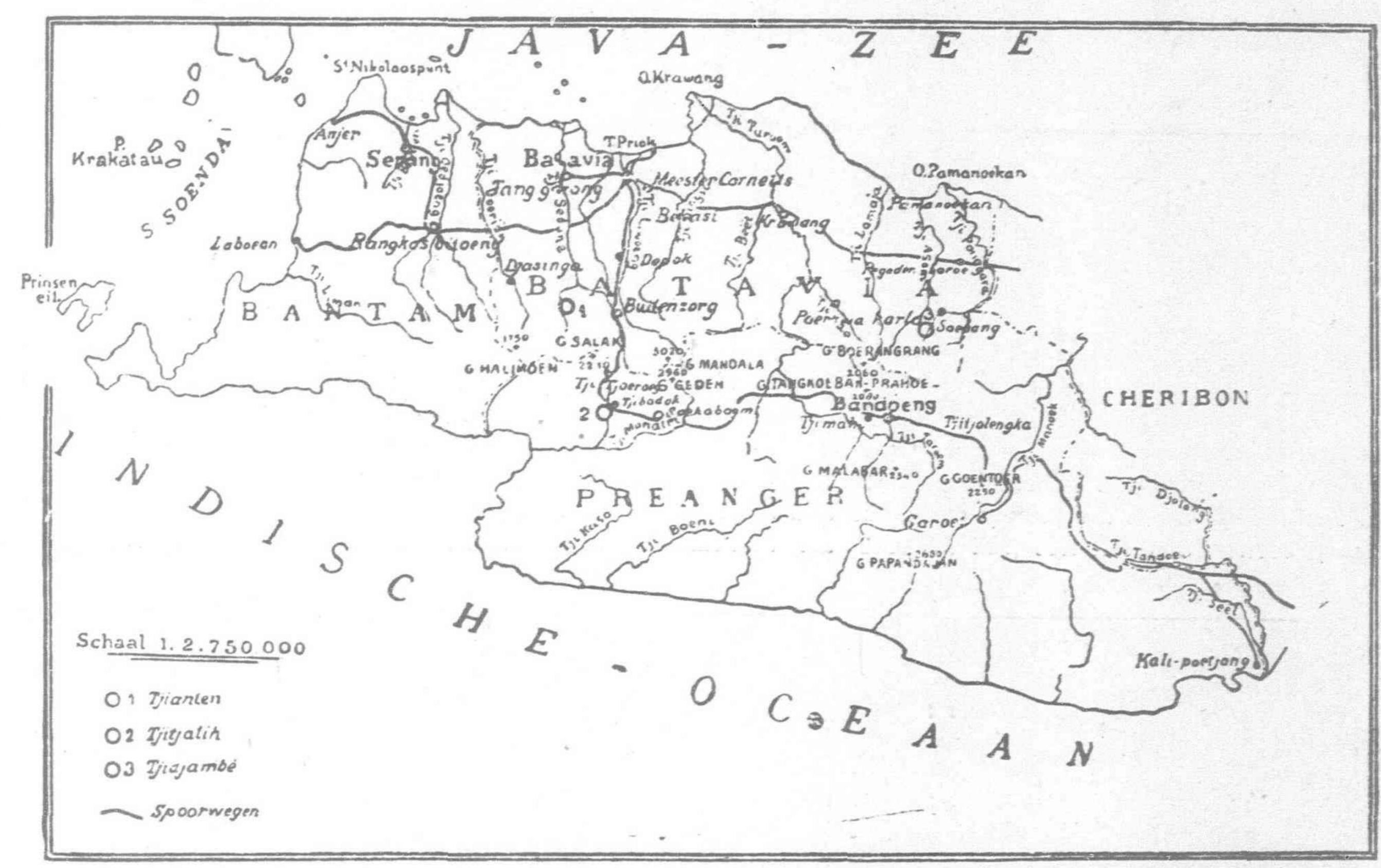
The first step taken by the government in the exploitation of the waterpower resources of the islands was the construction of a power station in the valley of the Tjiatoer River, near Madioen. Work on this project was begun in 1914 and completed four years later. The average capacity of this plant is about 2,000 horse-power, but at times as much as 3,000 horse-power is developed. The greater part of this energy is used for the workshops of the state railroad at Madioen, but some of it is sold to private enterprises, and the recent industrial activity in the surrounding district indicates that in a very short time all the surplus power will be contracted for.

In 1917 a second power station was erected in Sumatra for the purpose of supplying the gold mines in the Residency of Benkoelen with electric power. The necessary water for this purpose is drained from the lake of Tes in the Residency, and the power generated amounts to about 2,000 horse-power, although here also there is usually a sufficient volume of water to increase this by at least 50 per cent.

In 1917 an independent division for waterpower and electricity was established by the government, and facts and data regarding the waterpower resources of the archipelago were collected. Because of its dense population and its complete railroad system, which the government aimed to electrify, attention was for a time fixed on Java, but eventually private enterprise turned its attention to the other large islands of the group and discovered large sources of waterpower that were unused.

The government plan is to supply whole districts with sufficient power for the operation of railroads, factories and for supplying light for the cities. This is to be done by means of one or more co-operating central stations. The first step in this direction was taken last year when work was begun in the district of Bandoeng.

A private station capof developing 1,500 horsepower was taken over and doubled in size. Another power station with a capacity of from 2,300 to 4,500 horse-power is now being built. These two large stations will cooperate with two small ones that are already established in supply-Bandoeng with the power needed for the time being. Durthe four dry months of the year the waterpower stations will be supplemented by a caloric station. As soon as the present development is completed and the use of electricity becomes general several other waterpower resources in the district will be developed.



(From Holland's East India)

Map of West Java Showing Source of Water Power

Work on a power station in the Residency of Batavia was also begun last year, and when this project is completed it is probable that more than 50,000 horse-power will be generated. This develop-

the railroad such as Tandjong Priok, Batavia, Meester Cornelis, Depok, Bruitenzorg, Tjitjoeroeg, Tjibadak and Soekaboemi. The plant which is now in course of construction in the Preanger Regentschappen will have an initial capacity of 3,300 horse-power, but will be enlarged to at least 6,000 horse-power as soon as a reservoir can be constructed. A second power station will be constructed west of Bruitenzorg on a tributary of the Tjisadane. This station will be fitted with machinery for developing between 21,000 and 28,000 horse-power. It is expected that the work on this project will be begun this year.

These are only a few of the many developments that are planned. Because of the great difference in the volume of water in the river during the rainy season (eight months) and the dry season industries that can afford to remain idle for four months of the year will be in a much better position to obtain electric power in the immediate future than those which need power the year round. Eventually, how-

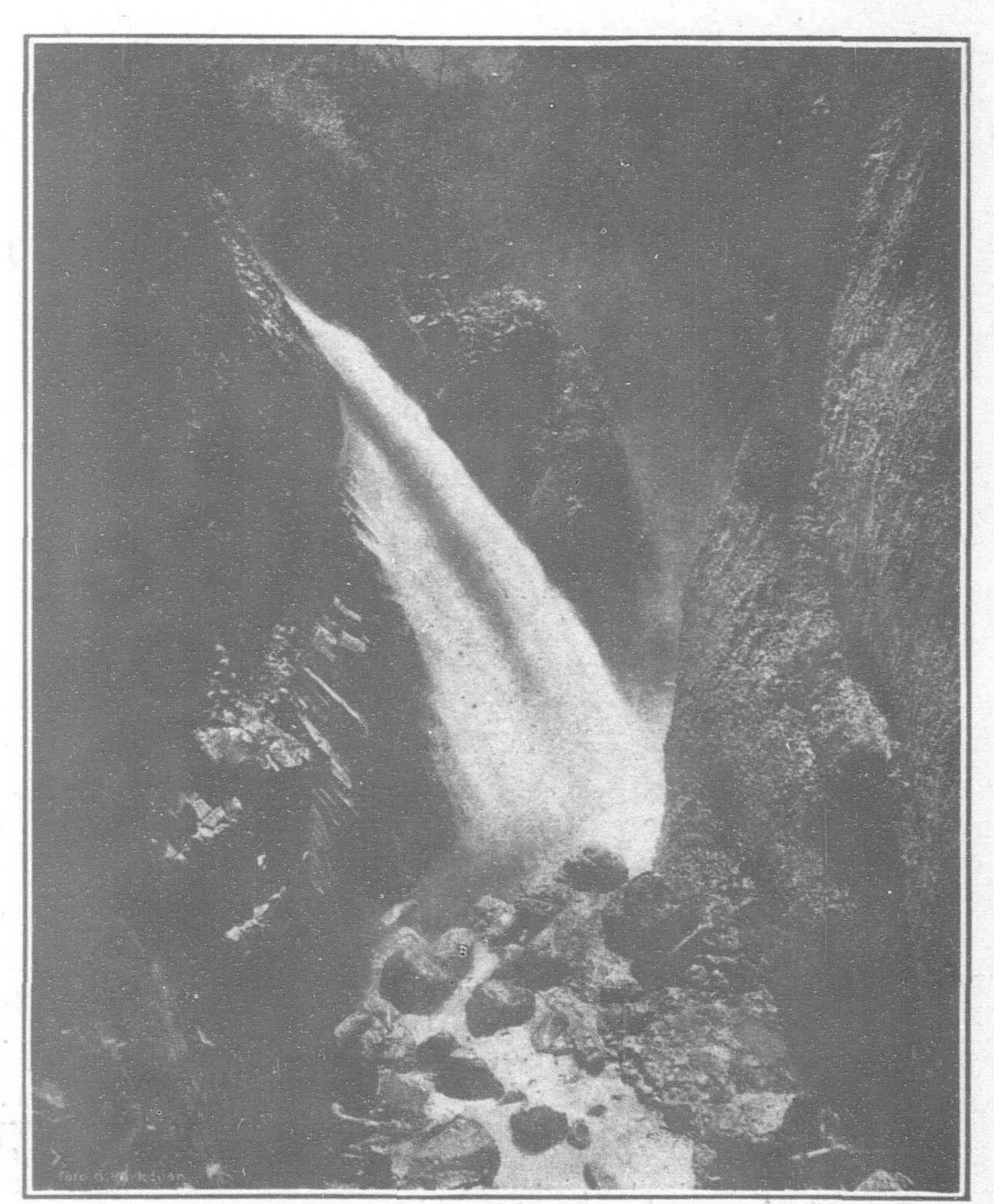
ever, it is probable that sufficient power will be developed to supply all industries the year round.

Such development will create a demand for large quantities of ment has been planned with a view of electrifying the Batavia electrical machinery, and, as the amount of power available in-Railroad and to supply light and energy to the towns along creases, for electrical devices of all kinds for the home and factory.

> WATER POWER CONCES-SION, JAVA.—A concession has just been granted by the Dutch East Indian government to L. A. Sand, a Norwegian residing at Pagilaran, Pekalongan, Java, allowing him to divert the whole of the waters of the Moesl River at or near the village of Despetah in the residency of Benkoelen, Sumatra, through a proposed short tunnel under the Barisan range of mountains and thence into the Indian Ocean a little to the north of the port of Benkoelen.

The concession has been granted primarily for a period of forty years and for the purpose of admitting the generation of electricity needed for the manufacture of fertilizers.

A yearly payment of one guilder per theoretical horsepower has to be made to the government, beginning in November, 1925, the number of horse-powers being fixed at one seventy-fifth of the product of the number of liters of water passing the turbines per second and the number of meters of static-



Waterfall of the Banjoepait (East Java)

The concession carries with it the exclusive right to mine, for the purpose of manufacture only the coal and limestone known to exist around the proposed site of the station, as well as the right to build the forty kilometers of railway needed to connect the proposed station with the Poelau Bay of Benkoelen, unless the same is built by the state, as in all probability will be the case, the line forming part of the railway which will connect Benkoelen with Telok Betoeng, Palembang, Padang and Medan.

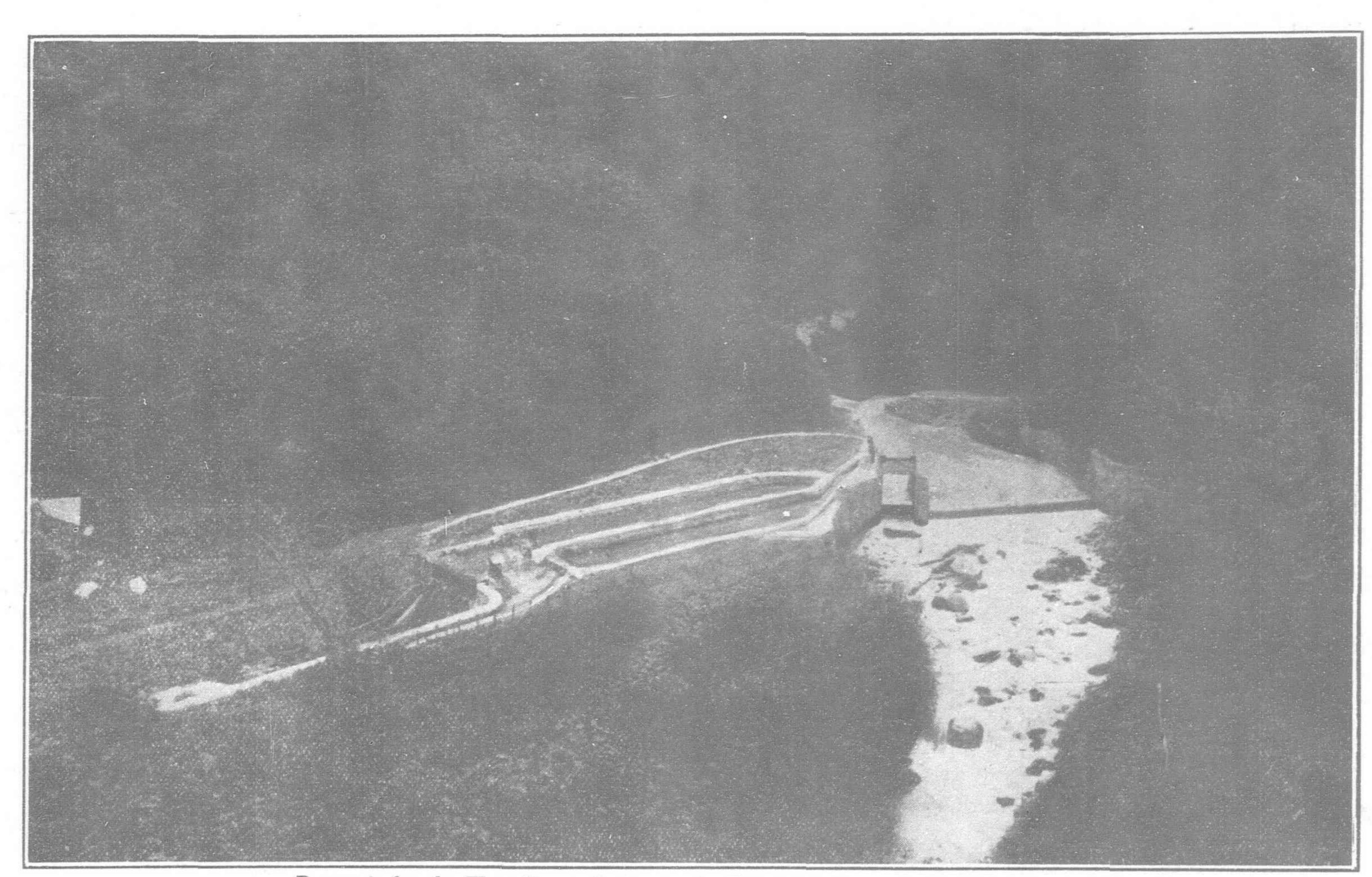
Netherlands East Indies Engineering

In the East Indies the demand for ice-making machinery, ice safes and chests for food and drinks is universal. Nearly every town has its ice factory. Portable ice machines would find a ready sale. Mineral waters are largely consumed and are made locally. Plant, bottles, and essences (full flavored) are in demand. The

In 1914 there were 190 sugar factories and 47 oil mills working in the Dutch East Indies.

The Federation of British Industries has already appreciated this fact and has appointed a commissioner to look after British trade interests in the East Indies. This gentleman, Mr. G. O. Blacker, was specially selected on account of his intimate knowledge of the market, and has established an office at Singapore, to act as a commercial and intelligence centre for his district, which includes, besides the Dutch East Indies, the Federated Malay States, Siam, French Indo-China, and the Philippines. His intention is to make periodical tours round these countries and get into personal touch with actual users of manufactured articles of all kinds.

METHOD OF PURCHASE, GOVERNMENT SUPPLIES.—Under the present method of purchasing supplies for the Dutch East Indian government, various departments are permitted to get the material in the local markets independently of one another, but if such material cannot be obtained locally or is thought better to be



Reservoir for the Water-Power Station in the Tjiatoer Valley, near Madioen (Java)

trade in motor-cars and cycles was captured by America during the war. There are 900 motor-cycles and about 3,000 cars registered in Soerabaya alone. The cars range from the most expensive to the cheapest, practically all with touring bodies.

The hardware trade was in German hands before the war. In addition to the hoes, machetes, etc., required by European-owned estates, there is a large trade in tools for native use. There is also a very large bazaar trade in cutlery, rice bowls, etc.

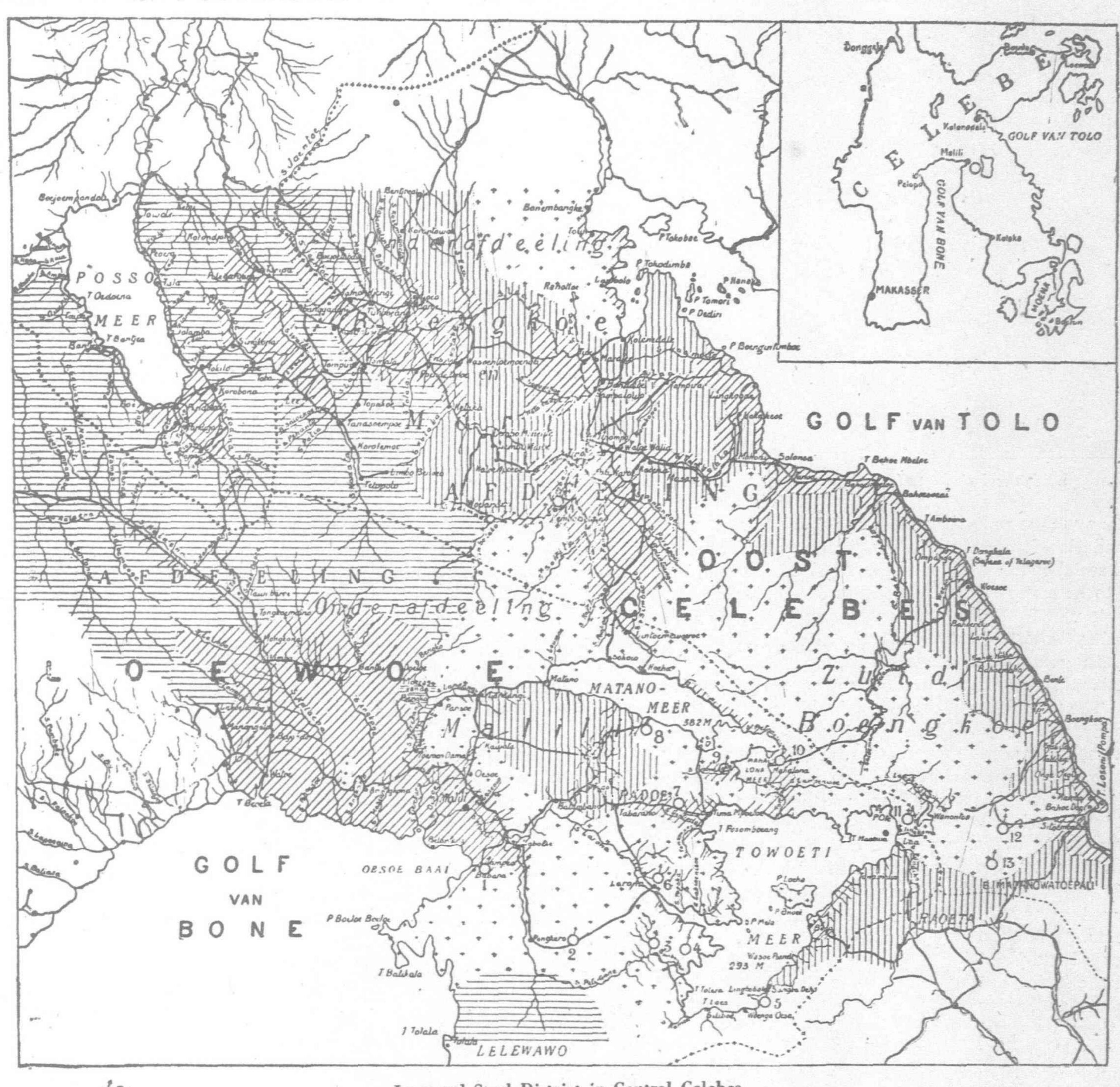
The bazaar trade is very important. There is a large trade in cotton piece goods, small wares, padlocks, small tin boxes, trunks, enamelware, cheap perfumes, fish hooks, etc.

It is impossible to deal with all articles, but amongst others the following are imported in large quantities:—Sanitary appliances, bar iron and steel, sheet brass and copper, wire, drugs, tinplates, ship chandler's stores, provisions, etc. There is also an increasing demand for sugar machinery and oil crushing machinery.

procured from abroad, a requisition is made on the colonial department of the home government, which makes the purchase through its purchasing bureau. Though this method has its advantages, especially during war times when materials are hard to get, the government is said to have lost considerable sums through one department bidding against another.

With the hope of effecting a saving to the government and making the purchasing abroad more effective, officers of the colonial department of the home government have been in the colony for some months, arranging for a re-organization of the local purchasing system along more scientific lines.

Under this new plan, except for such articles as require special knowledge in selecting and testing, all purchases will be made through the purchasing bureau of the colonial department, which will have an office at Batavia besides the organization abroad. Duplicate requisitions will be sent to the Batavia office and to The



Iron and Steel District in Central Celebes

Hague, every opportunity possible being given the home business community to participate in the business. When, however, it is decided to make the purchase abroad, a requisition is sent to the branch office in New York and European manufac-

turers are notified that the purchasing office at The Hague is open to receive offers. Though this New York office has had wide discretion in purchasing, the probabilities are that requisitions will more and more bear instructions to refer prices and conditions to The Hague before definitely purchasing, as the European sources of supply open up.

The purchases for the government are a very important item in the imports of this colony, totaling in 1917 over 20,000,000 florins, or about \$8,000,000, not including imports of gold and silver, and in 1918 the imports into Java and Madoera alone amounted to 27,360, 221 florins, or approximately \$11,000,000, of which the United States supplied \$1,170,000 of sundry imports and \$2,262,000 of iron and steel products.

While the colonial government stands ready to give advice to the various district governments, their purchasing is done by the

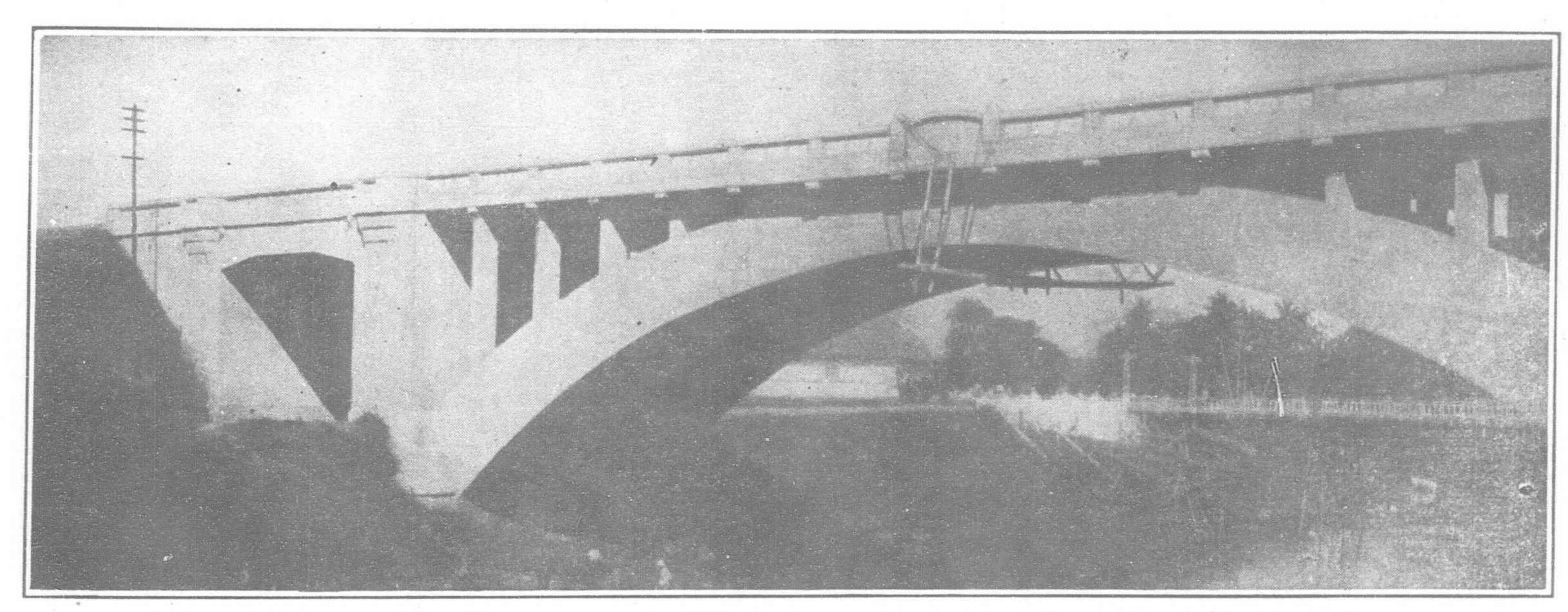
several minor governments themselves, save when the colonial government builds the improvements.

Dutch Borneo Development

The request for permission to lay down a tramway in the north-west of Borneo was the immediate cause of the government exploring the Residency of the western division of Borneo, which consists for the greater part of self-governing provinces.

It appears that, without any European aid worth mentioning, the Chinese who form the industrious part of the population there, have taken the lead in the economical development of the country and have brought significant prosperity to that part of the division. In this they have also had the support of the Malay, and together with them have set an example to the Dyaks who still form one-half of the population, by bringing about improved conditions of living by means of their industry.

After an almost interminable period of internal unrest and insecurity through lack of an energetic and powerful rule by a central authority, the disturbances and lawless conditions have during the last ten years gradually come to an end.



Bridge and viaduct of reinforced-concrete over the Tjiliwong between Manggarai and Meeter-Cornelis (Residency Batavia)

This was the result of the policy of the civil authorities and laid the foundation for economical prosperity and a peaceful development of social conditions. Order and peace once established, there appear to be many elements useful in economical development of the country.

During the latter half of the 18th century and in the beginning of the 19th gold-mining attracted a numerous Chinese population to Pontianak, Mandor, Montrado, Sambas, and the various coast places. The exhaustion of the mines made them turn to agriculture for a living, and as the abandoned mining districts were no use for cultivation, emigration to the coast was inevitable.

Again, the briny sea-climate of the north-west coast of Borneo makes it exceptionally suitable for the cultivation of the cocoa-palm, which together with the culture of gambir, pepper and rubber has gradually spread over the whole strip of coast a 1000 kilometers long and about 5 kilometers wide. Although the Malays had from the early days applied themselves to this culture, they were easily outstripped by the Chinese who had a more intensive system of

cultivation. While the Malay uses little judgment in the laying out of his plots and never cleans them properly, the Chinese, by regular and judicious outlay and by keeping in good condition the plots succeeds in getting much higher profits. This is why the Chinese consider it an advantage to take over the Malay plots and thus continually extend the cocoanut plantations.

From a distance of 25 kilometers south of Pontianak up to the same distance noth of the Sambas river and along that river up to Sambas, there is a

numerous population almost equally distributed over the country while on the river estuaries important centres of traffic have arisen.

In this coast district, repeated attempts have been made since 1875 to open up local communication by digging canals parallel to the coast. Since 1913 several roads have been constructed: a main road runs from Pontianak along the coast up to Pamangkat, following the course of the canals; from this again branch roads lead from Pamangkat to Sambas and from various other places into the interior, where the rubber culture is taking on considerable dimensions.

Because of the long distances, the making and up-keep of these roads is not only most difficult, but also very costly, especially now that the work has to be done by paid labor. And besides, a single coast road is not sufficient for the longer distances; and it is only a cheap and swift communication such as a tramway, for instance that can cope with the ever increasing traffic. Especially is this the case in connection with the land lying between Pontianak and Sambas, covering a distance of 220 kilometers and which is greatly in need of improved means of communication. A tramway through it then would in every respect be likely to bring about a higher degree of prosperity.

With regard to the motor traffic, which has ever since the middle of 1913 been rapidly increasing between Singkawang and Pontianak, it is safe to suppose that at any rate for the next 10 years the quantity of traffic will show a growing tendency. Of

course it is unlikely that a tramway would immediately absorb the whole of the transport, as it will take some time to make the people adapt themselves to the new vehicle. The dangers and losses, however, to which goods are exposed by sea will aid considerably towards the choice of a quick and safe tramway for the transport of goods.

Besides the economical use of the projected tramway, there are yet other interests which it will serve. It will perceptibly lighten the task of government,

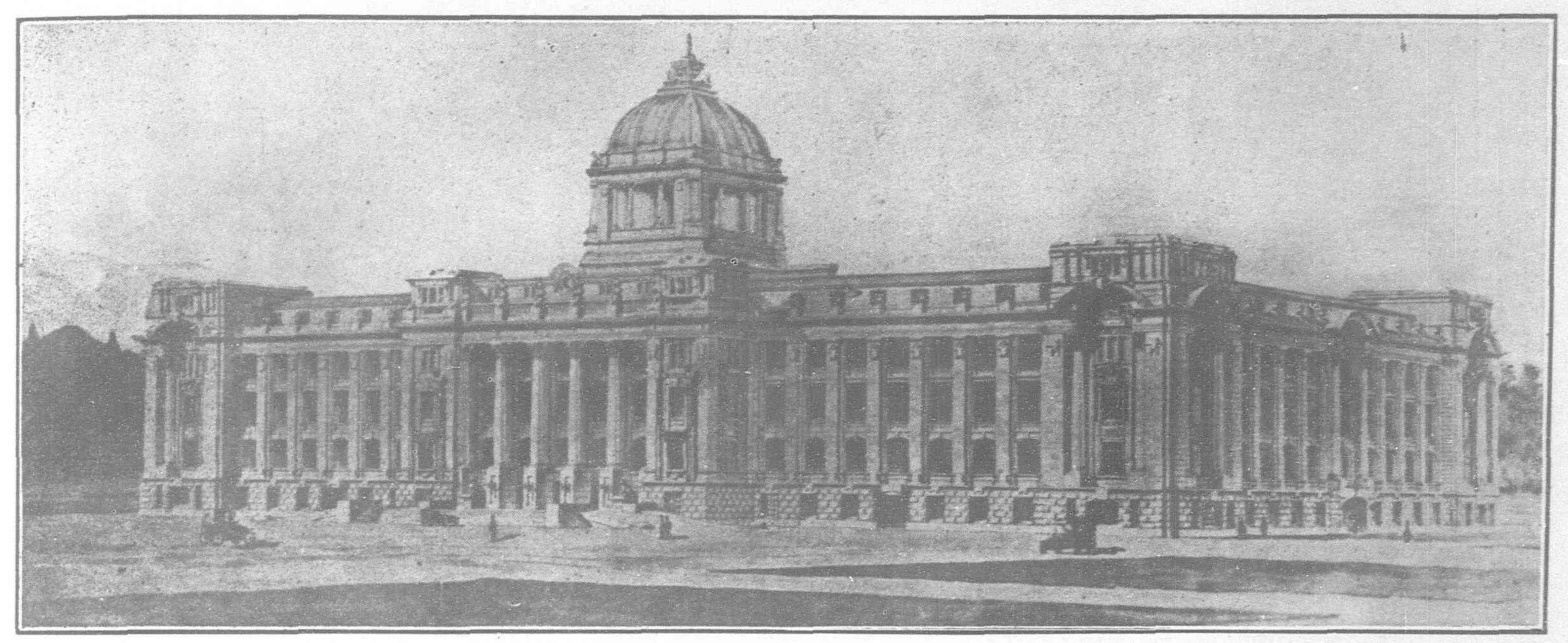


Tramway in Totoko, Celebes

thus bringing indirect financial advantages as well. From a political point of view too the tram will be of great importance, in uniting the different influences emanating from the various peoples with those of the authorities at Pontianak. As a result of the Dutch line of conduct during the war the Chinese have developed a strong feeling of sympathy and esteem for the Dutch government.

Public Works in Korea

ROAD CONSTRUCTION AND HARBOR IMPROVEMENTS



New Government General Offices to be completed in 1924

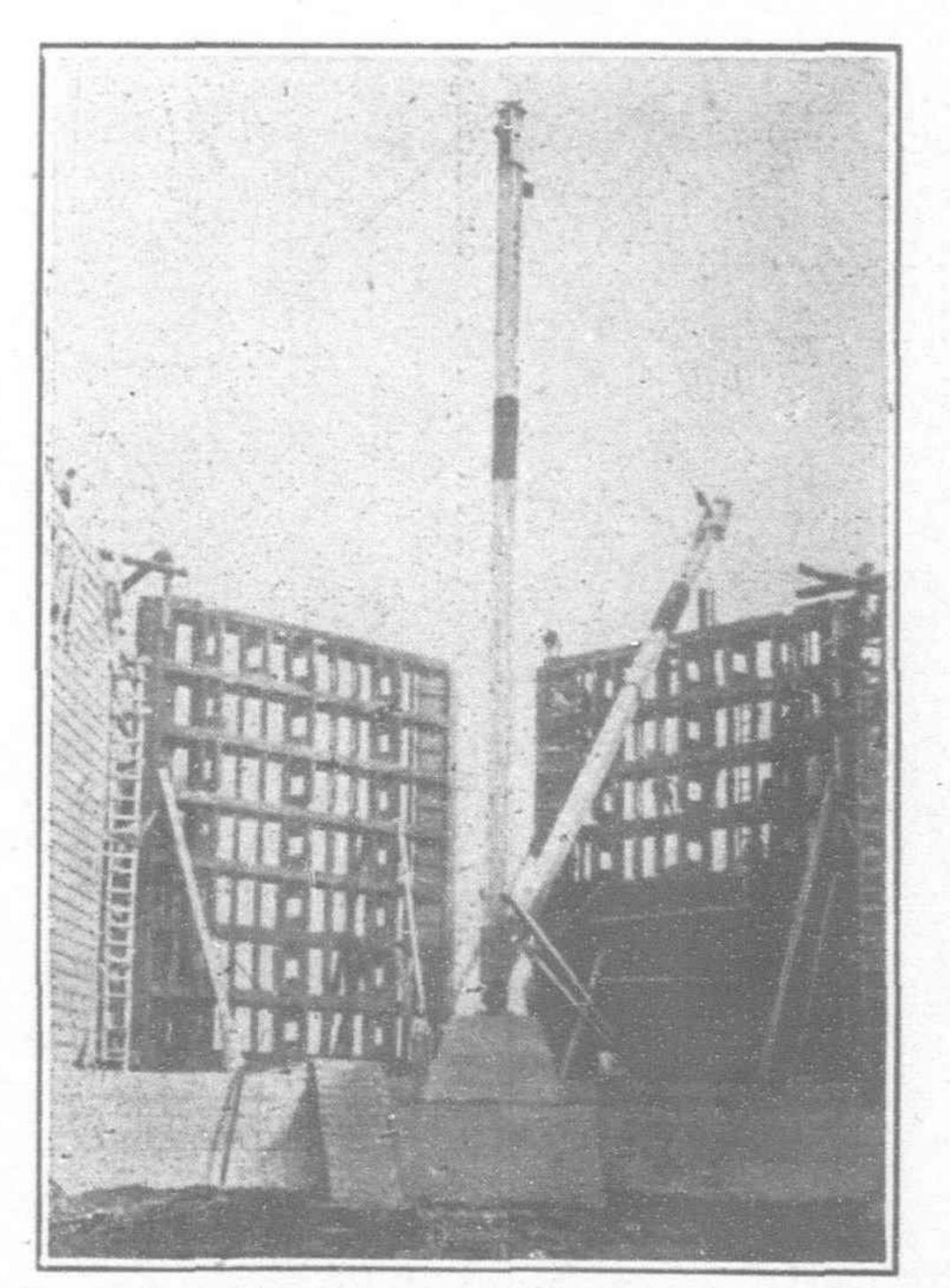
HE execution of the first programme for the projected network of State highways, which had been going on since 1911 as a seven-year consecutive work and embraced the construction of 34 State roads of the first and second class, measuring 685 ri, improvement of four streets in the city of Keijo, and the building of an iron bridge across the Kan-ko (River Han), was successfully accomplished in October, 1917, at a cost of Y.10,000,000. This, in addition to the roads constructed by Provincial Governments with the aid of the Central Government, brings the total length of first and second-class highways already completed to a little over 1,270 ri, making quite a marked effect upon the system of communication connecting the different provinces.

When the completion of the first programme was in sight, a second programme to construct 25 first and second-class roads, measuring 477 ri in all, and to build nine bridges across certain important rivers, at the cost of Y.7,500,000, was projected. This work was begun in October, 1917, on the completion of the first program, and is to continue till the year 1922 as a six-year consecutive work.

Although the government-general is primarily responsible for the construction of first and second-class roads, it is permissible for any provincial government, if desirous of taking up the work to meet local needs too pressing to wait for it to be done by the government-general, to carry out the construction of such roads at once. In such case the government-general gives financial aid to the province, provided the local government takes care that the road comes up to the standard required by the government-general.

With regard to third-class roads, provincial governments are directly responsible for their construction and must meet the necessary expenses, but the plan of the proposed roads must first be submitted to, and obtain the approval of, the government-general, so that they may be made in conformity with the general plan laid down for road construction throughout the peninsula.

Of the projected network of state roads measuring 5,900 ri, first and second-class roads measuring 892 ri have already been built by the government-general, the expenditure being defrayed from the state funds, while first, second and third-class roads measuring 2,697 ri have been made by the provincial governments. In carrying out this work they received subsidies from the government-general for 497 ri, the remaining mileage being constructed at local expense and by means of contributed labour or corvée.*



Lock Gates in Course of Construction, Jinsen (Chemulpo) Harbor Works

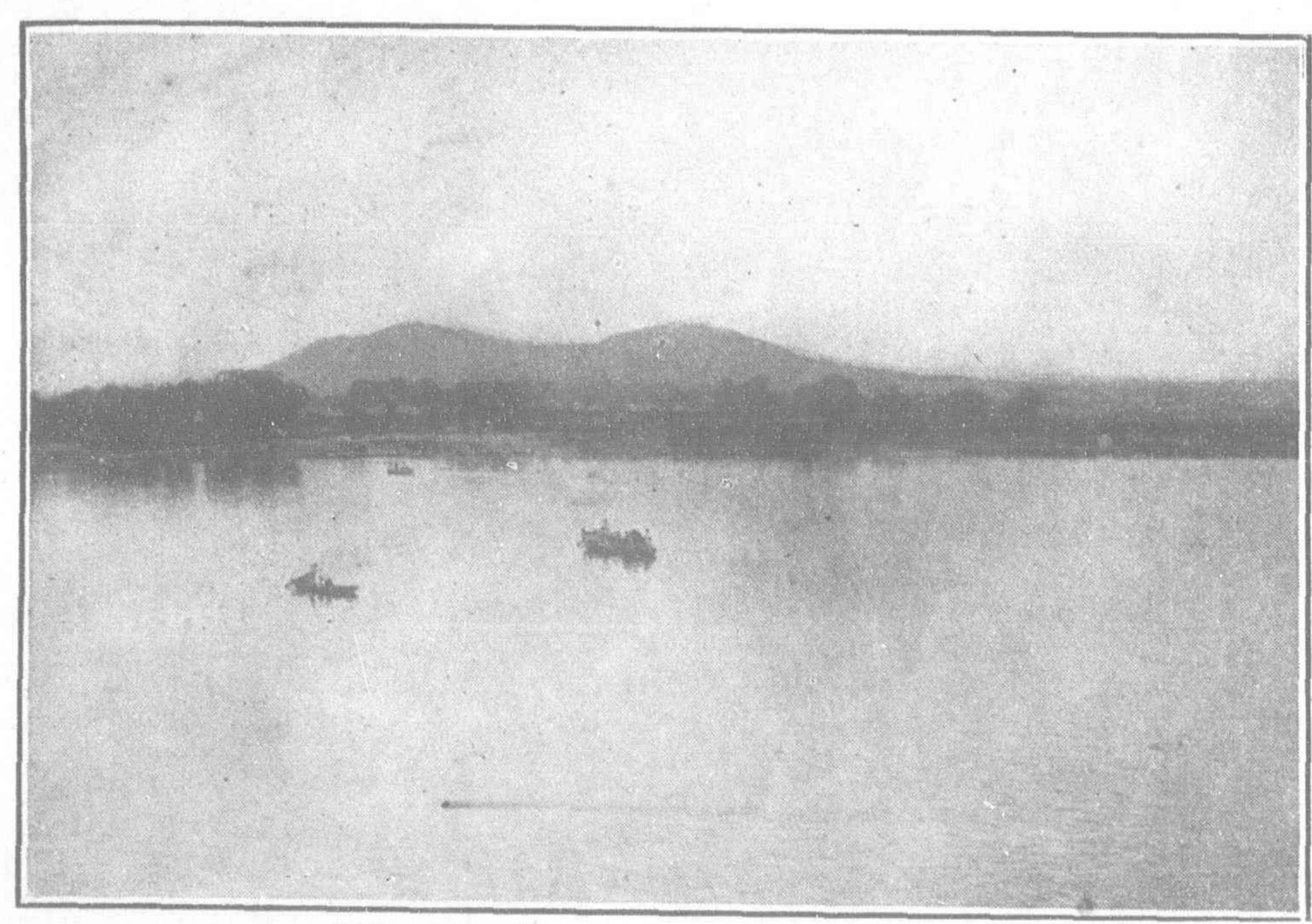
Street Improvement †

As the first program of reconstruction in Keijo, a plan was drawn up for a seven-year consecutive work at an estimate of Y.2,300,000, by which thirteen principal streets, 4 to 15 ken wide and measuring 6,744 ken in all, were to be improved, and this has been in the course of execution since 1913. Meanwhile, it was found that the estimate made was more than sufficient for the work, so part of the second program, comprising three streets 8 to 10

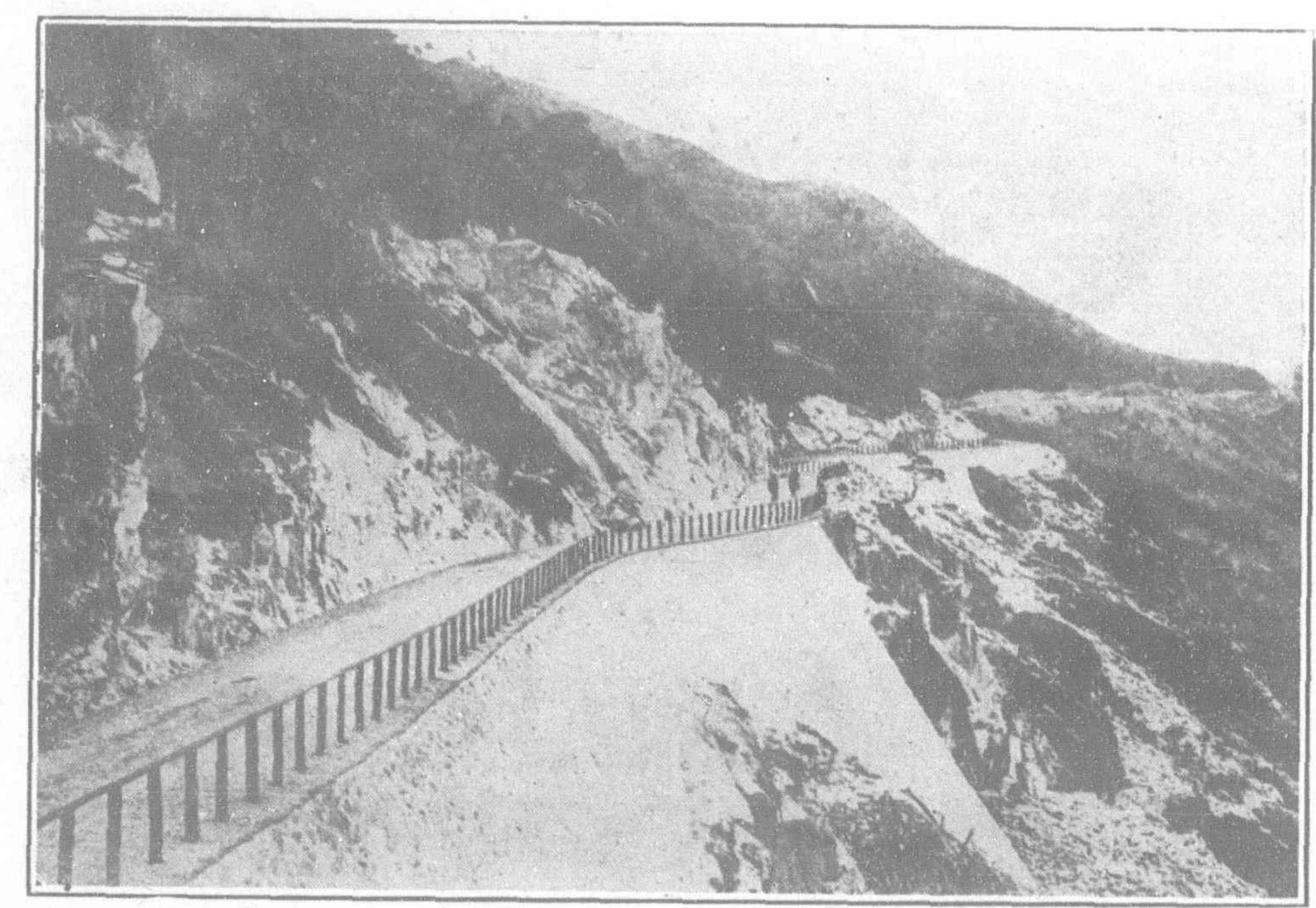
^{*}The custom of Puyok (賦後), contribution of labor for road construction or other public works, has been in existence for ages past, but, in the course of time, it became greatly abused, and most of the yangban, the literati, and influential people secured exemption from the service. At present the burden is equally borne by all, though those not capable of contributing labor are permitted to liquidate the demand on them by the payment of its equivalent in money.

[†]Street improvement in cities and towns is carried out either by the government-general or by the provincial governments. The improvement works in the cities of Keijo and Chinkai are undertaken by the former.

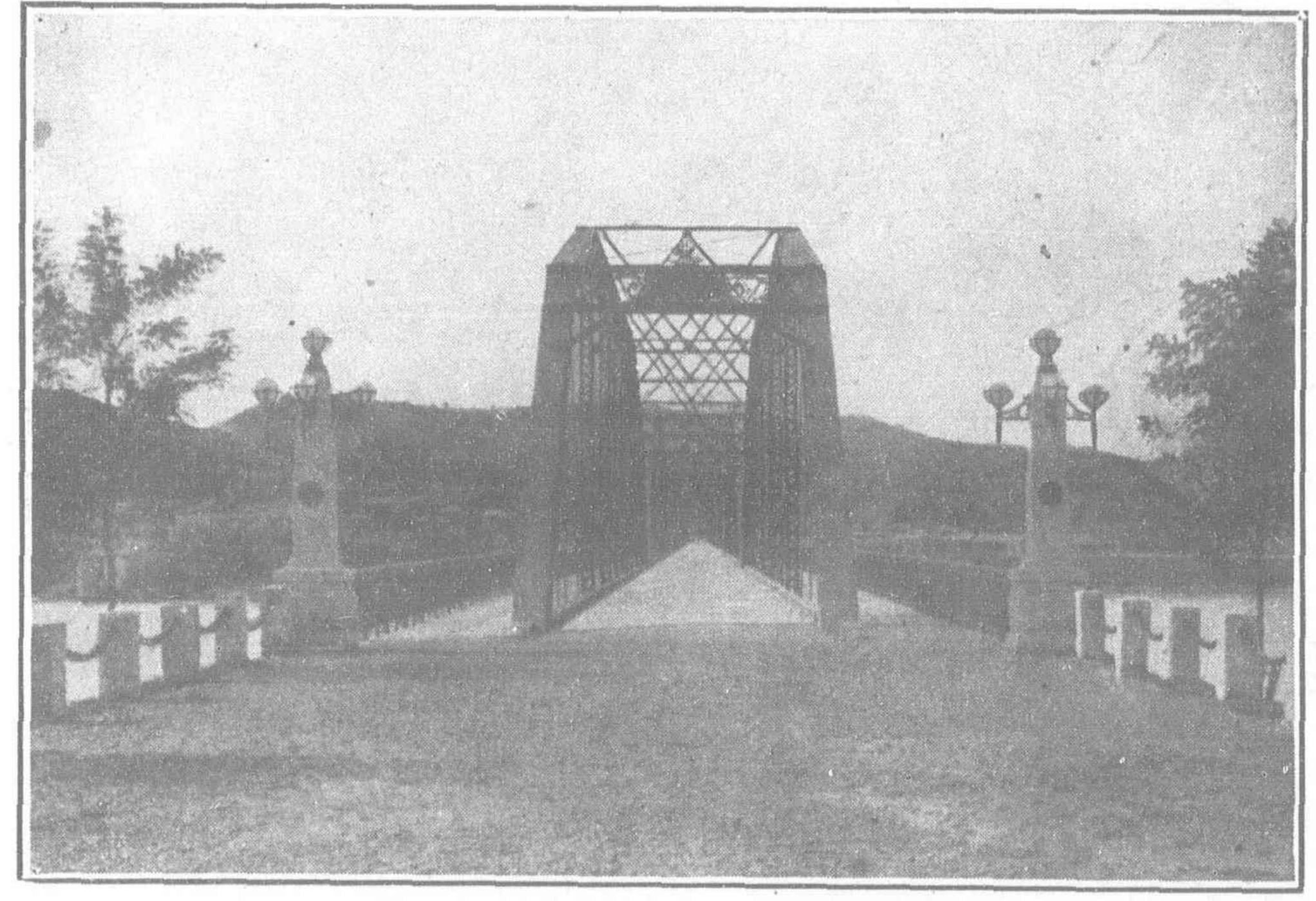
PUBLIC WORKS IN KOREA



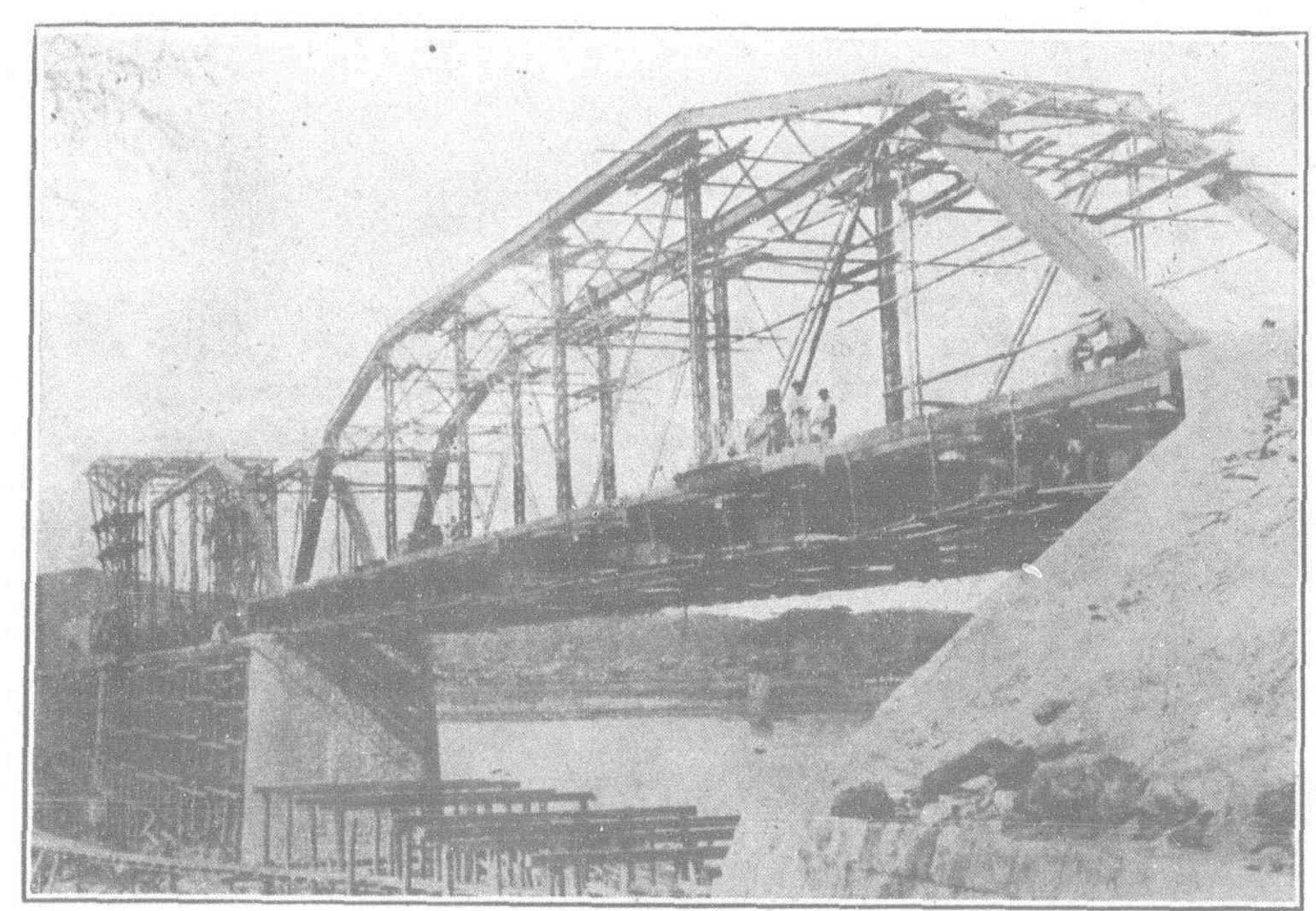
Before the Construction of the Iron Bridge



New Road Construction, Kwaiyan District, North Chusei Province



New Steel Bridge over the Main River



Hanko Iron Bridge in Course of Construction

ken in width and 881 ken in length, was added on to the first program. At the end of the fiscal year under review, seven streets, measuring 4,948 ken, and certain other improvements had already been completed at the cost of Y.1,560,000.

In Chinkai, the first program of reconstruction work, which has been going on since 1912, at an estimate of Y.318,000, came to an end in the fiscal year under review at the actual cost of Y.263,000. The amount remaining, Y.54,000, was spent in constructing a road between Shogen and Kendo because of its unmistakable importance with regard to the development of Chinkai.

In provincial cities and towns, street improvement is carried on by the provincial governments under the approval of the government-general with state subsidies, or with local funds and contributed labor. During the year under review, government approval for this purpose was given to Kankyo, Chosin, Mitsuyo, Heiho, and Ranan. The towns of Shoshu, Hoko, and Shunsen are now at work on street improvement, having been permitted to take it up in previous years. For Shingishu, a plan to improve the streets and sewerage system as a two-year consecutive work at a cost of Y.48,000 was submitted, and the government-general not only approved the project but agreed to assist by meeting



Old Street, Heijo (Nyong-yang)

half the total expenditure. The allotted work for the fiscal year under review was satisfactorily accomplished at a cost of Y.26,000.

Harbor Improvement

Of the harbor improvement which has been going on, since 1911, at Jinsen and five other ports as a nine-year consecutive work at an estimated cost of Y.9,831,829, the work at Chinnampo and Heijo has already been completed; but at Jinsen it was found necessary to enlarge the project, so work on a second program was started at an estimate of Y.1,750,000 as a four-year consecutive work, thereby making the total estimate for general harbor improvement Y.11,581,829, spread over ten consecutive years.

In Fusan, though a large portion of the work was accomplished by the end of the previous year, during the fiscal year under review it was not possible to carry on the work as satisfactorily as before on account of the scarcity of iron material, and some part of the project (about one per cent.) had to be postponed to the fiscal year following. Of the work accomplished in the fiscal year, the construction of Pier No. 2 was the most important. This pier has a width of 21 ken and a length of 200 ken, and has the railway extended to it, thereby affording direct connection between trains and steamers. As the depth of water at the pier is from 27 to 36 feet, it can easily accommodate two steamers on either side from 7,000 to 20,000 tons each. When the pier is open to use, it is easy to imagine what an important role the port of Fusan will play

in the Far East as a terminal of the continental railway traversing both Europe and Asia.

In Jinsen, where a wet dock is under construction, the work on the quay, wall, storage, and lock-gate having been completed by the end of this fiscal year, only the dredging of a small portion of both fairways and the inside of the wet dock is left for the fiscal year following.

However, as the tidal current in the port of Jinsen is too rapid for the safety and convenience of ships entering and leaving the wet dock, a second program for the construction of a stone wall between Jinsen and Rose Island to provide a basin for small boats, the widening of the channel, and the completion of land equipments was started during the fiscal year under review.

In Genzan, the improvement work is progressing smoothly. Reclamation, dredging, wall construction, setting up of caissons, construction of two breakwaters, improvement of the road connecting the railway station with the water-front, taken altogether, show a development of about 52 per cent. of the whole work.

Besides the above-mentioned ten-year consecutive work of harbor improvement undertaken by the government-general, the four-year consecutive work of breaking rocks under the water in



Improved Street, Heijo

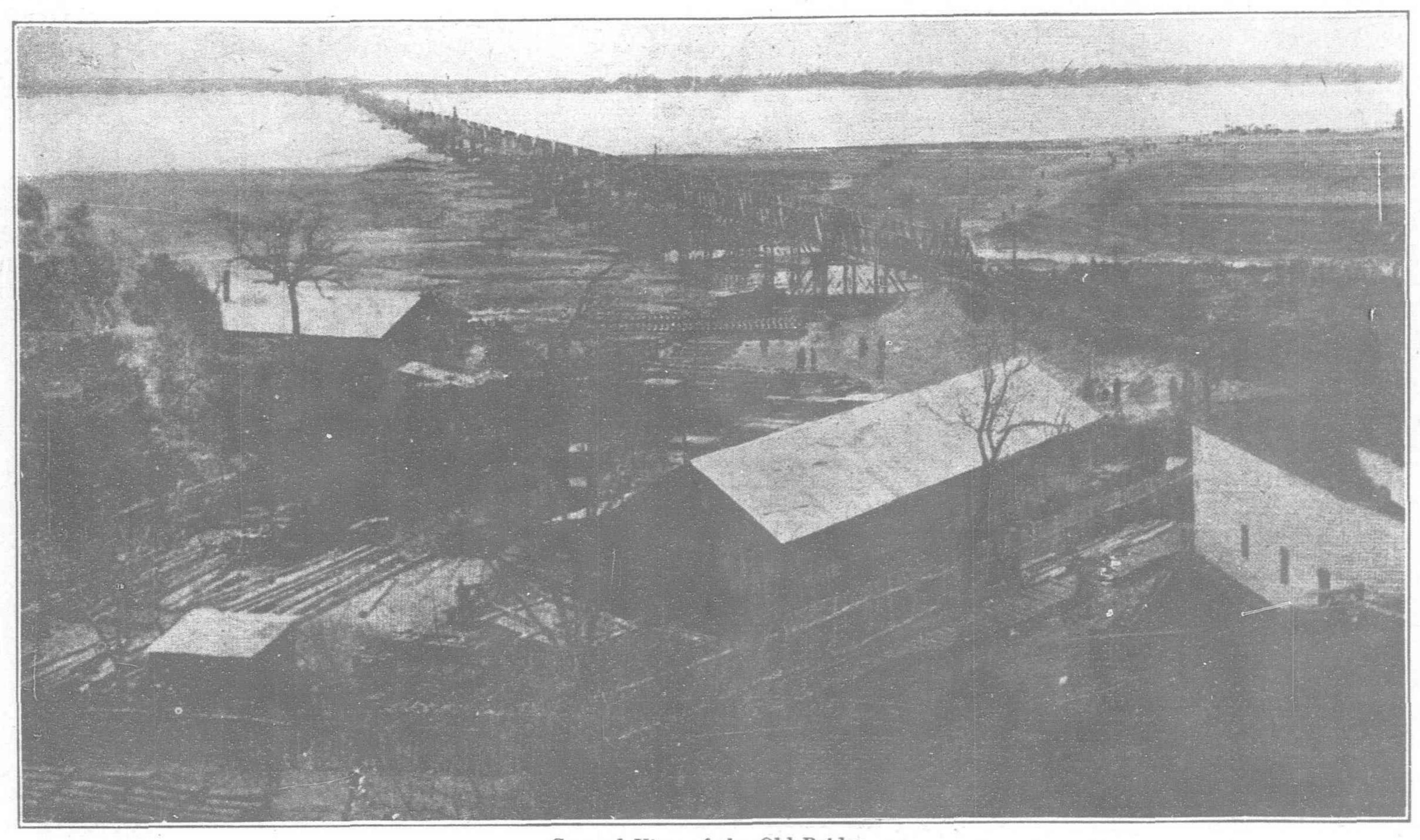
the port of Jinsen, which has been going on since 1914, came to a successful termination in the fiscal year under review, resulting in the removal altogether of 13,300 tons of rock and 59,400 tons of gravel.

The expenses incurred during the fiscal year under review for the work of improvement and equipment of harbors other than those already mentioned amounted to Y.101,900, the ports benefited being Kunsan, Mokpo, and Chinnampo.

River Investigation

Although the general exploration of the 13 large rivers of the country was started in 1915 and was completed in the same year, the necessity of obtaining particular information about them, in order to draw up a plan for their improvement and utilization, soon became apparent, and a program was made in 1916 for their actual survey, beginning with (1) those rivers watering the greater portion of the farming area, and (2) those subject to natural calamities, such as floods, etc., oftener than others, but still not so difficult or expensive to improve as others; and the practical survey and systematic investigation of them were started in the same year as a ten-year consecutive work. For the fiscal year under review, a sum of Y.40,000, as in the previous year, was apportioned to meet the expenses for river improvement, and the actual survey of part of the Ryuko and Sainei, as well as the execution of minor improvements to several rivers, was carried out in the year 1917.

The Yellow River Bridge



General View of the Old Bridge

HE Chinese ministry of communications invites sealed proposals from bridge constructors for designing and building a new steel bridge about 2,800 meters in length across the Yellow River (Hwang-Ho). Proposals will be received up to noon of June 30th, 1921, at the office of the Peking-Hankow Railway, Peking, China. Plans, rules, and specifications can be obtained from the following offices:—

Peking: Peking-Hankow Railway, American, British, Bel-

gian, French, Italian and Japanese Legations.

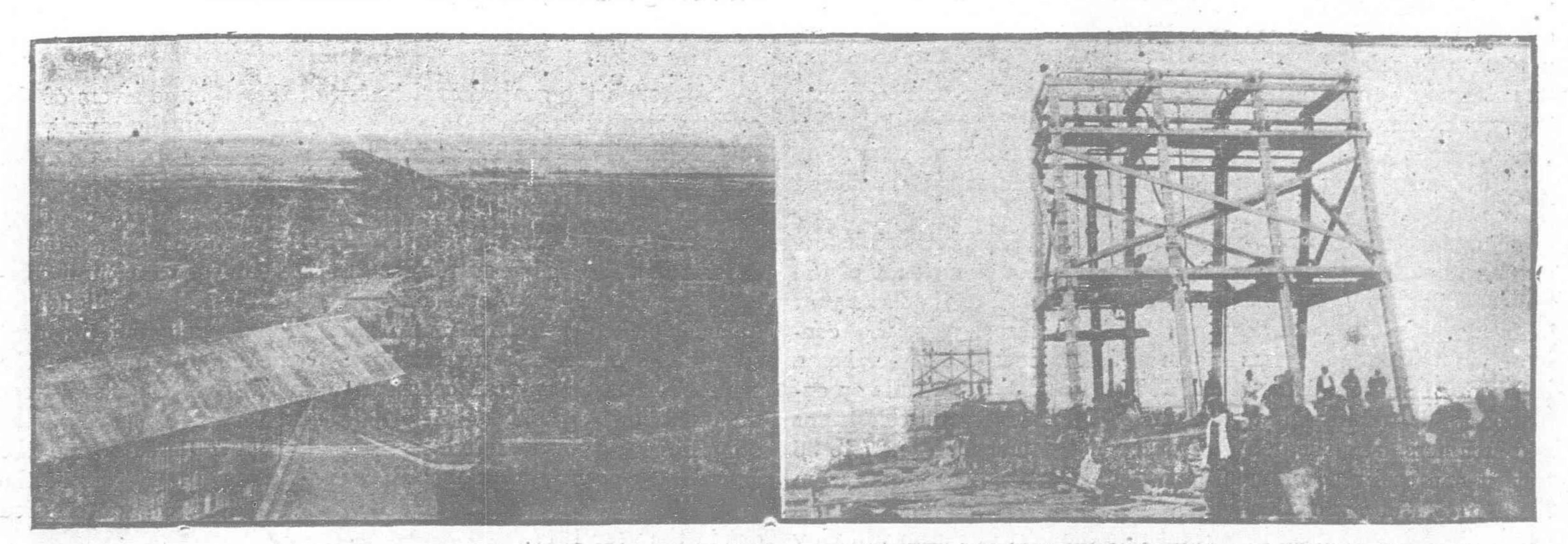
FOREIGN: Chinese Legations, Washington, London, Brussels, Paris, Rome and Tokyo.

All applications for same must be accompanied with £6.

Peking-Hankow Railway Administration.

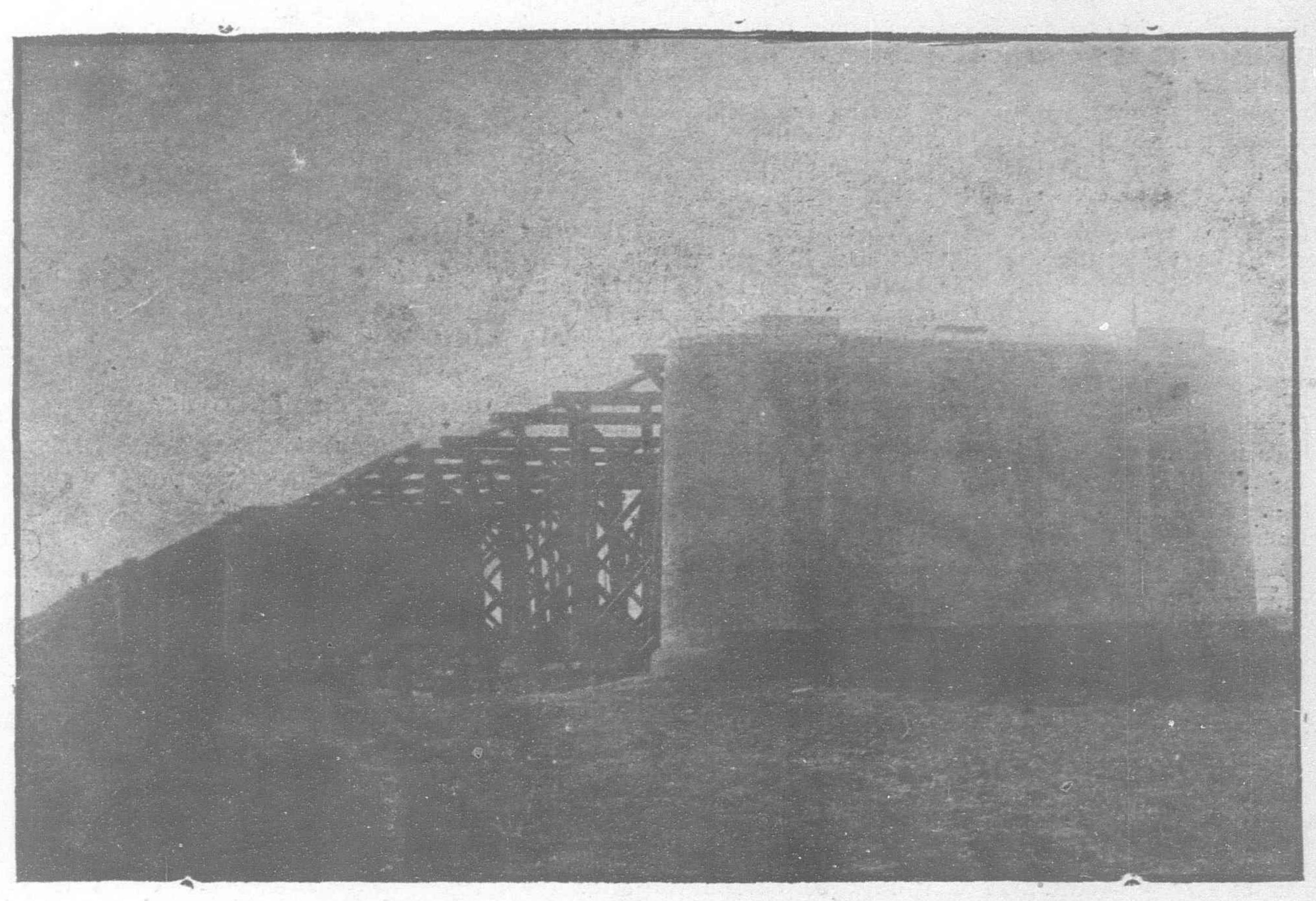
Information about the construction of the old bridge has been very limited. At the time of its completion the following information was given to The Far Eastern Review by the French engineer-in-chief in charge of its construction.

"This structure is 3,010 metres long. The construction of this bridge was a unique feat in engineering and one on which the eyes of the engineering world was earnestly fixed. It is about 6.25 meters above high-water level, and is of steel throughout, the massive girders being supported on sets of screw-driven tubular piles. The steel piles were screwed into the bed of the river by means of hand capstans manned by squads of coolies. In fact all bridges are of steel and like construction, while the approaches and other masonry work are of concrete. The bottom end of each pile has a tooth point with a large inclined blade



Girder Construction and Sinking Screw-Driven Piles for the Old Yellow River Bridge

above it, not unlike the tip of a corkscrew. To each point was clamped an enormous grooved pulley, around which was wound a wire hawser. One end was led to one of the capstans, and then the coolies heaved away and the work of screwing began. The rotary motion of the piles, with the corkscrew blade, naturally screwed the pile down into the mud till the pulley was level with the platform on which the workmen were standing. When the pulley reached this another platform, length of pile was bolted together, the pulley raised to the upper flanges, and the screwing resumed. When the piles had been screwed to a sufficient depth, say 12 to 15 meters, the water was pumped



General Type of Pier Construction, the Old Yellow River Bridge

out from the interior. The pile was then filled with concrete. Wooden piles were then driven around the current side of the piers in the shape of a triangle, with the points to the current, as a protection to the structure. Huge beds of tree branches, lashed together with wire, were then sunk around the steel piers, and on these beds hundreds and hundreds of tons of rock were thrown. This was reckoned to give more solidity to the river bed where the piers were driven, and possibly prevent the river

washing away the foundations, if such the shifting bed of the river can be called. The steel piles were placed in sets of four, six, eight and ten, and each pile is joined by stanchions and girders of great strength, and finally each set of piles is spanned by an enormous girder on which the rails are laid. Half of this bridge was built in France, the other half in Belgium.

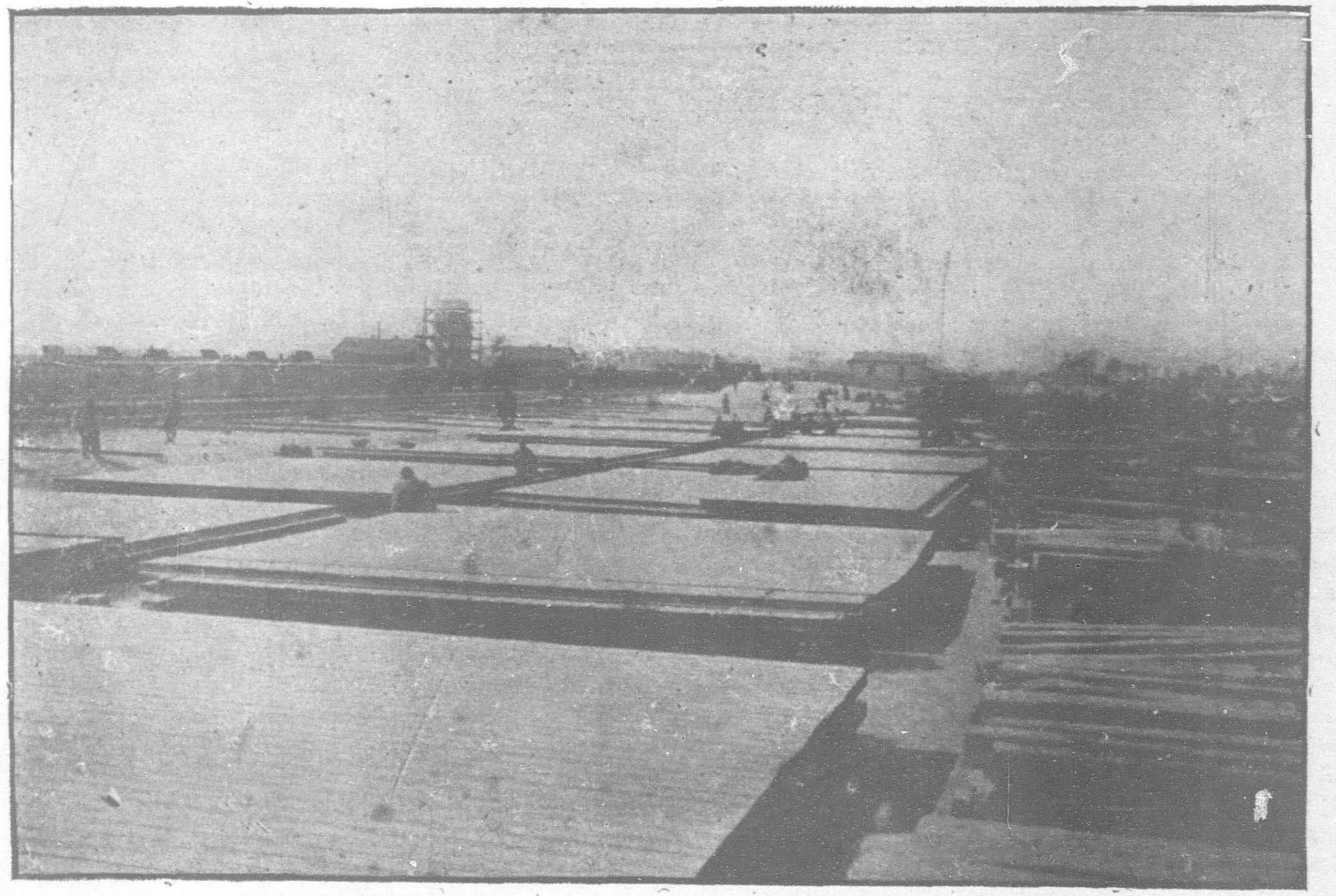
"The river bed is one gigantic quicksand and during the construction of the bridge many piles were sucked under as well as

platforms supporting machinery. Break-waters of stone have been built along the banks of the river to prevent the undermining of the bridge foundations, and either end of the structure is protected with stone-faced dykes to prevent the water washing away the dykes."

The governor of Honan in 1909 called attention to the state of this bridge. It seems that the stream is undermining the pillars supporting the bridge and the safety of the structure is threatened. Aside from this the bridge is said to be altering the current, so that serious trouble may be looked for.

In connection with the advertisement for the new bridge, the minister of communications has issued the following letter for public information:—

ic information:—
"The attention of



Mobilized Millions of Tons of Material Utilized for Rail and Bridge Work

this ministry has been called to the publication of an article of the *Morning Post*, containing allegations about the overestimate of the Yellow River Bridge. As such allegations may tend to create misunderstandings, the following statement of facts about this subject is furnished for public information:—

"The Yellow River Bridge was completed in 1906, and it was only meant to be a temporary structure. With a view to prepare for its ultimate replacement by a permanent one, the director-general of the railway department in 1913 had started a sinking fund for this purpose. The decision was then made to set aside \$1,000,000 each year out of the surplus of the Peking-Hankow line as special reserve, so that in time the accumulated sum would be sufficient for the construction of a new bridge. It was unfortunate, however, when Minister Yeh assumed office in last August, he found all the cash funds specially reserved for this purpose had been misappropriated, leaving only \$2,000,000 in Peking notes, and \$178,100 in cash, whereas there should have been \$791,000 in cash, \$2,250,000 in Peking notes, \$1,635,000 in Seventh Year Domestic Bonds, and \$483,000 from matured bonds.

"Finding the sinking fund so depleted, and realizing that time prevented the original plan of providing funds from being carried out, the minister decided, as the reconstruction of the bridge has become more and more imperative, to call for tenders for the work. This has been done, not only in China but also in foreign countries, throughout the world, and the various foreign ministers in Peking have been requested to give assistance in this regard. Already numerous applications for details have been made by leading foreign bridge constructors and their estimates and plans must be in the hands of the ministry by the end of June, 1921.

"Before tenders come in no-one at this time knows how much the bridge will cost." It can only be determined after the character of the bridge has been decided upon. Therefore the charge that this ministry has overstimated the cost of reconstructing the bridge by some \$4,000,000, and the baseless declaration that \$6,000,000 would be sufficient for this undertaking is absolutely false."

Some idea of the old bridge and methods of construction can be obtained from the accompanying views taken when it was building.

Wool and Wool Manufacture

VERY interesting booklet upon Wool and Wool Manufacture written primarily for the layman has been issued by The First National Bank of Boston. It has been written by Mr. James Paul Warburg of the staff of The First National Bank and follows the wool industry from the raising of the sheep to the marketing of the finished products. The United States grows only about onehalf of the wool consumed in this country and 70 per cent. of the wool imported comes into the United States through the Port of Boston. About one-half of this amount, or 35 per cent. of all the wool imported into the United States, is financed by The First National Bank of Boston, which it is evident speaks with authority concerning the industry. Part 1 of the booklet is devoted to the raw material and covers such subjects as sheep raising, shearing and marketing of fleece wools and general classification of wools. Part 2 covers the various processes of worsted manufacture. Part 3 covers woollen manufacture. Part 4 is devoted to the financial aspect of the wool industry. This section gives in brief the methods of financing from the raisers of sheep to the distributors of the manufactured products. The booklet is written with as little technicality as is possible and contains only such statistics as are necessary for the adequate understanding of the subject. It is generously supplied with illustrations. This booklet will be found of great interest to those who are engaged in any branch of the wool industry and to those indirectly connected therewith. A copy may be obtained by addressing the Commercial Service Department of The First National Bank of Boston.

Japan to Adopt Metric System

THE Department of Agriculture and Commerce has decided, according to the Chuo, to adopt the metric system of measurement, and for this purpose a special committee has been appointed to start preliminary investigations. Taking advantage of the government decision, architects throughout Japan have organized an association with a view to introducing the metric system in the construction of all Japanese houses whether for dwelling or any other purpose.

"In constructing Japanese buildings, considerable inconvenience is experienced because of the absence of unity in the system of measurement," says Dr. Sano, of the Tokyo Imperial University and a member of the above government committee, as quoted by the *Chuo*. "In order to improve the efficiency of architects, as well as in the interests of economy, it is highly advisable to unify the system of measurement. Investigations have thus been started with a view to introducing the metric system in Japan. The result will be made public in March next, when the new system will be adopted first by the association of architects. According to the government authorities, the new system will thoroughly replace the old Japanese measurement system within ten years."

Chinese Cotton Displaces American Cotton

(Special Correspondence of "The Far Eastern Review")

New Orleans, La., November 15.—Chinese cotton growers are steadily becoming independent of the American staple, it is stated here, where there is considerable interest in the development of cotton mills in China. Here are some startling figures:

CHINA'S CONSUMPTION OF AMERICAN COTTON

1912

\$3,175.504 1,379,654

Cotton seed imported from the United States has produced a staple that competes successfully with the parent fibre.

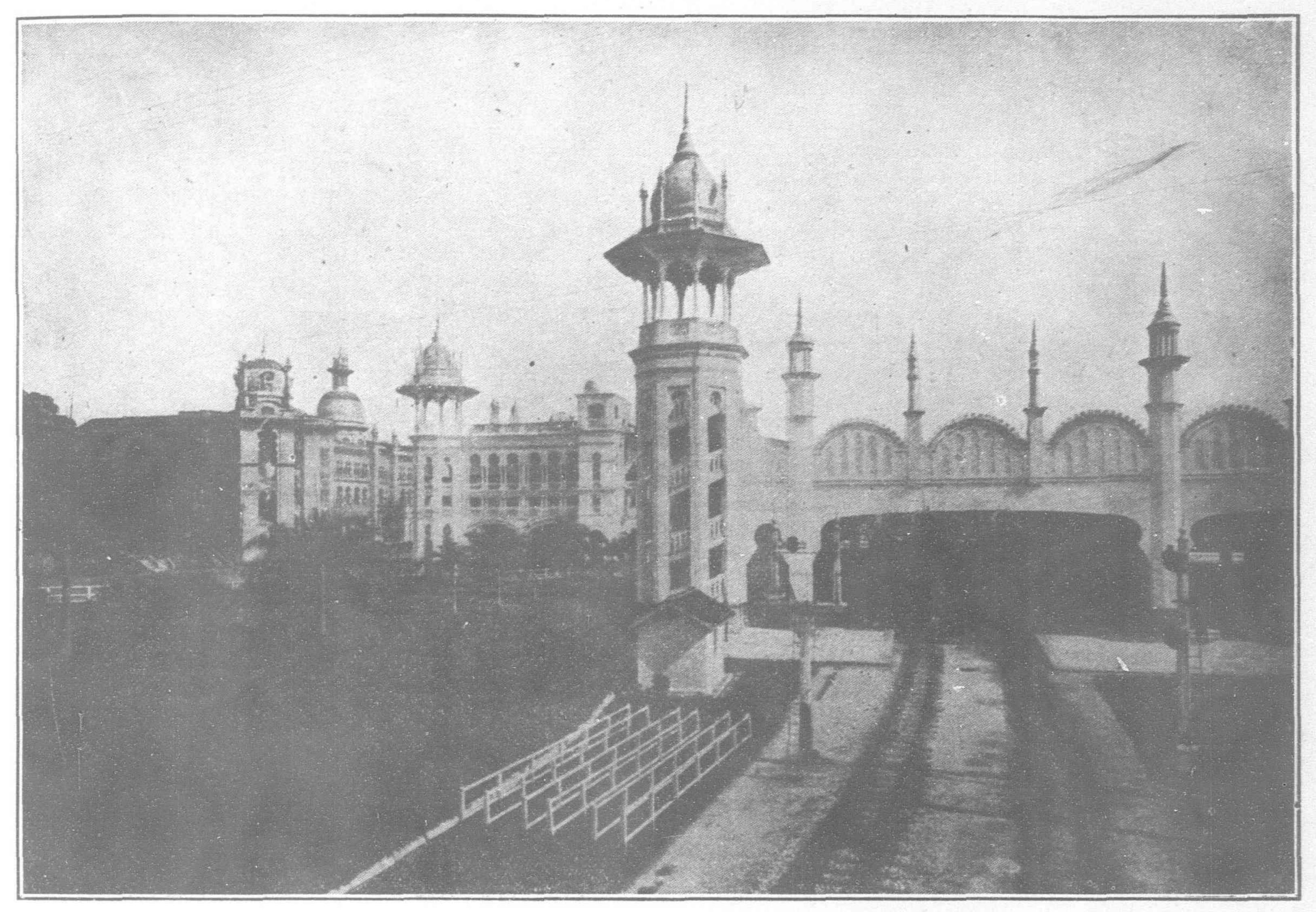
"Keep the Cotton and Sell the Cloth"

(Special Correspondence of "The Far Eastern Review")

Greenville, S.C., November 8.—Chinese competition in the growth and manufacture of cotton has drawn the attention of planters to the speech at Maplewood, N.H., of Daniel H. Douty, advising eastern cotton mill men to unite with growers in a movement "to keep the raw cotton, manufacture it and sell the cloth." Greenville recently enjoyed a visit from Mr. C, C. Nieh, president of the Chinese chambers of commerce and the most prominent Chinese cotton magnate. In a speech made at the Southern Textile Exposition, the Chinese visitor gave facts and figures showing that in a few years China has doubled the number of her spindles. In Tientsin, alone, ten mills were added within a year. In his address Mr. Nieh stated that in the past year the Chinese have purchased forty-five cotton mills in the United States and plan to purchase a great deal more. One of America's leading cotton experts is now in China, he said, to teach the people here to improve the growing of cotton. Over 2,500,000 spindles are now running and Mr. Nieh expects China soon to pass the 3,000,000 mark. Ten years ago there were only 900,000 spindles in China.

Federated Malay States Railways

NOTES FROM 1919 REPORT



· Central Offices, Hotel and Railway Station, Kuala Lumpur, F.M.S. Railways

during the year 1919 produced a net profit of \$3,310,446.62, after providing for the contribution to the imperial government for war purposes, compared with \$3,399,358.19 in 1918, representing 2.67 per cent. on the total capital expenditure against 3.12 per cent. in 1918. The contribution to the imperial government for war purposes has been fixed at the same figure as for 1918, viz., \$360,895.22. The continued rise in the price of materials and labor seriously affect the cost of constructing and equipping new railways. Locomotives, which in 1914 were bought for £4,299, now cost £10,475 whilst rails are £16 per ton as compared with £6 15s. and steel bridge work £29 17s. per ton as against £12 7s. and other materials in like proportion whilst local labor costs have increased by 30 per cent.

No new lines were opened for traffic during the year. The total mileage of running lines (reduced to single track) open on 31st December, 1919, was 1,002 miles 55 chains, and of running lines and sidings 1,131 miles 75 chains as compared with 1,001 miles 76 chains and 1,128 miles 9 chains at the end of 1918.

Capital Account.—The total capital expenditure to 31st December, 1919, is \$123,681,858.07. The expenditure during the year was \$14,709,733.64 as compared with \$3,584,111.30 in 1918. Of the current year's expenditure, the large amount of \$5,952,735.63

falls under the head of rolling stock, while lines not open for traffic (including widenings and additions) absorb \$7,655,202.28.

REVENUE RECEIPTS AND EXPENDITURE.—The receipts from all sources amounted to \$14,957,468.53 compared with \$13,106,-512.67 in 1918, an increase of \$1,850,955.86 or 14.1 per cent.

The revenue expenditure on all accounts, excluding only the contribution for war purposes, amounted to \$11,286,126.69 compared with \$9,170,147.70, an increase of \$2,115,978.99, or 23.1 per cent.

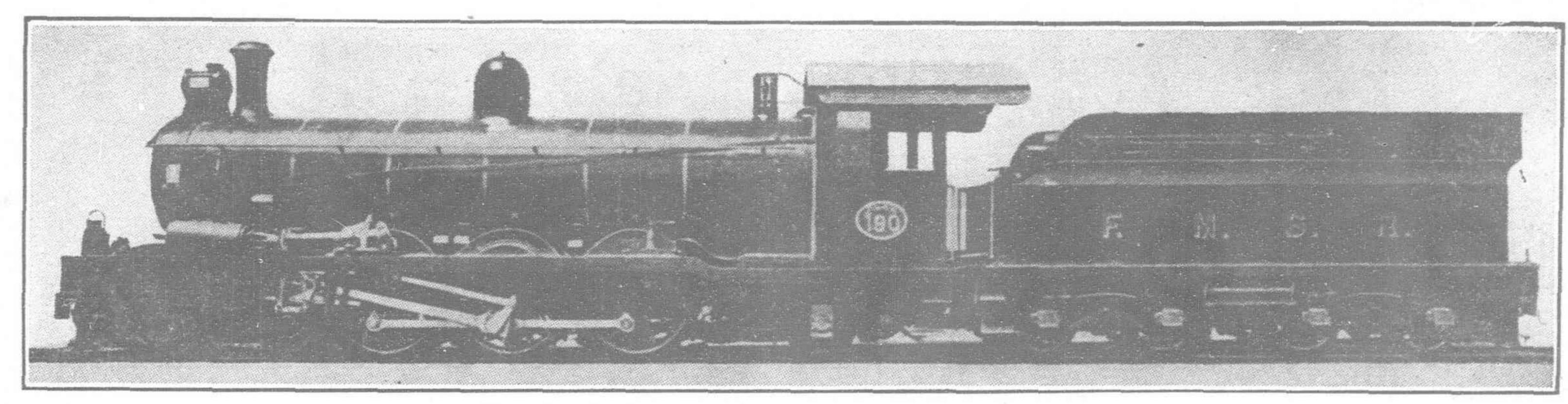
RAILWAY WORKING—RECEIPTS.—Passenger receipts increased by \$1,114,105.40 (17.30 per cent.) and the number of passengers carried has increased by \$19,149.

The percentages of increase are:

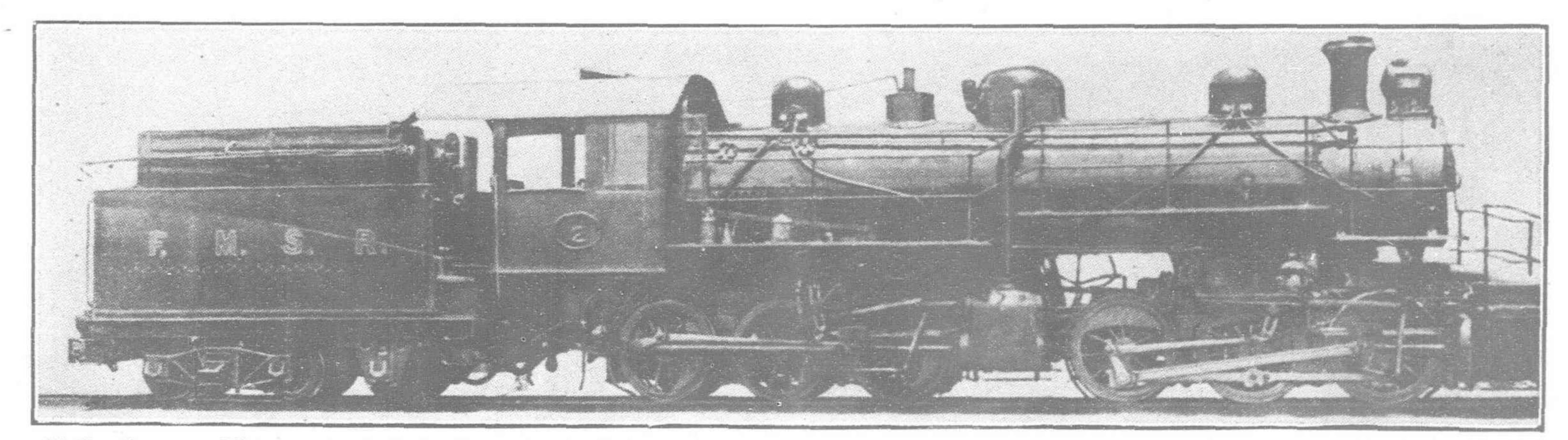
1st Class... 33.41 per cent. 2nd ,, 30.56 ,, 3rd ,, 11.41 ,,

Goods train receipts are 9.04 per cent. higher than in 1918. The most noticeable item is rubber, which has increased by 30 per cent., and it is interesting to note that the receipts under this heading for 1919 are practically double those recorded for 1916.

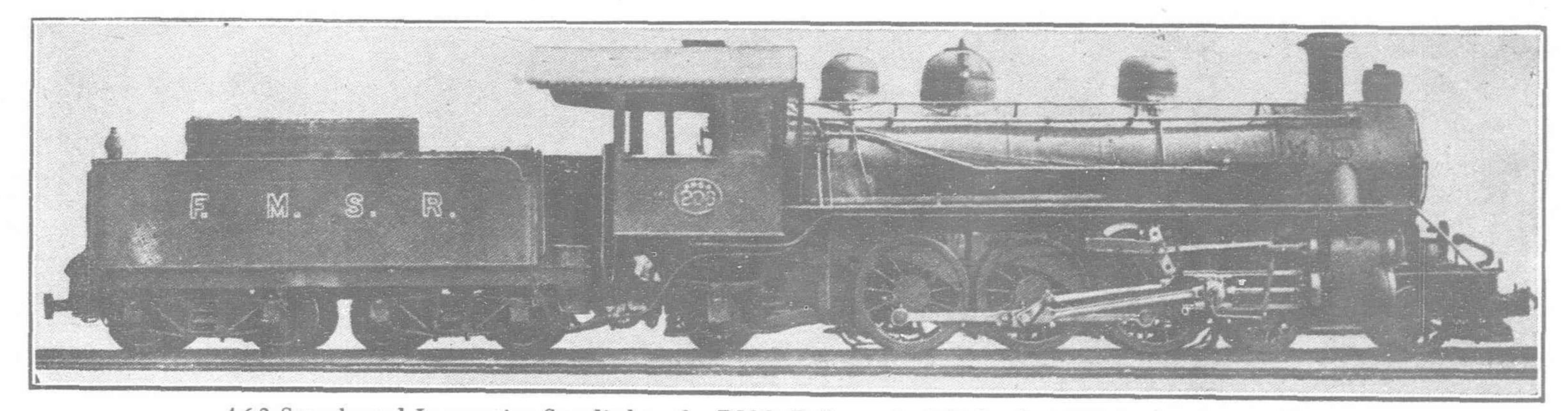
EXPENDITURE.—The total expenditure shows an increase of \$1,976,313.74 or 24.5 per cent. over 1918, while the percentage to



British 4-6-2 Superheated Locomotive, F.M.S. Railways



Mallet Compound Locomotive built for Russia by the Baldwin Locomotive Works. Two of which were purchased by the F.M.S. Railways in 1919.



4-6-2 Superheated Locomotive Supplied to the F.M.S. Railways in 1919 by the Baldwin Locomotive Works.

the total traffic receipts increased from 66.08 per cent. to 72.34 per cent.

The increase under maintenance and renewal of ways and works is \$268,821.67 (11 per cent.). The amount included under this abstract in respect of special services chargeable to revenue is \$498,062.06, a sum greater by about \$80,000 than in 1918. The most notable items are the increases in maintenance of signalling and of stations, depots and offices. Under maintenance and renewal of rolling stock there is a total increase of \$471,133.73 (39.7 per cent.). The increase in locomotive running expenses is not so great as in other abstracts, amounting in all to \$35,227.23, or 1.64 per cent. There are increases on all heads of account except fuel, and the expenditure on lubricants was 41 per cent. higher than in 1918, due entirely to the rise in prices. Fuel shows a decrease of \$72,801.57, which is accounted for by the fact that considerably less imported coal was purchased in 1919 than in the previous year. The cost of fuel per engine mile is reduced from 31 cents to 28 cents, and the total running costs per engine mile are 46 cents for 1919 compared with 47 cents in 1918. Traffic expenses are higher all round, and there has been a considerable increase in the amount payable for compensation, the actual ex-

penditure under this head being more than double the sum paid in 1918.

Port Swettenham

During the year, 63 ocean steamers called at Port Swettenham with import cargo as against 30 during 1918, and 32 ocean steamers called for export cargo as against 9 during 1918. These figures are exclusive of the British India Company's steamers which call regularly at the port. Forty-four thousand five hundred and fourteen tons of rubber were exported through Port Swettenham during the year as against 32,011 tons in 1918 and 35,587 in 1917.

Ways and Works Department.—The following renewals were made: 1,004 rails, 23 points and 70 crossings. Ninety-eight thousand and forty-two cubic yards of ballast were supplied and 70,525 cubic yards of earth for cessing deposited on banks. In addition to above, 1,175 cubic yards of stone and 356 cubic yards of sand were used for special service works as compared with 2,171 cubic yards of stone and 27,639 cubic yards of sand in 1918.

Ways and Works Depot.—This establishment has continued its usefulness and the internal arrangements of

the depot have been expanded. During the year machinery ordered from Japan and America was received to the value of \$38,996.56.

The following machines were installed:

One large planing machine;

One vertical drilling machine;

Three small drilling machines;

One emery grind-stone;

One lathe;

One hand-screwing machine.

The depot is now in a position to manufacture all permanent way fittings required by the Construction Department and open lines.

Maintenance per mile of line open per week was \$37.48 as compared with \$34.36 in 1918. The expenditure on slips and wash-aways was \$20,020.58. The 1,002 miles 55 chains of running miles, together with 129 miles 20 chains of sidings, were maintained in good running order.

TIMBER DEPARTMENT.—The following is a comparative statement of sleepers purchased during 1918 and 1919:

| Description | | 1918. | 1919. |
|-------------------|------|---------|-------------|
| First class | | 306,649 | 186,834 |
| Second class | | 26,422 | 21,125 |
| Third class | | 4,333 | 3,858 |
| Crossing sleepers | | 3,926 | 8,282 |

The value of 1919 purchases being \$409,422.73.

203,471 in 1918, the cost being \$512,552.39. The book balance on hand on 31st December, 1919, was 133,830. sleepers, the value of which was \$236,185.09.

LOCOMOTIVES. -We received 12 Pacific type and two Mallet locomotives built by Messrs. Baldwin, of Philadelphia, Ipoh Station Hotel, F.M.S. Railways

and two Mallet locomotives were added to the stock and the remaining four are under erection. Orders were placed in England for 10 "I" Class, 10 "L" Class and 16 "P" Class locomotives during the year. The open line stock of locomotives, including the steam rail motors, was 185 on the 31st December, 1919, as against 180 on 31st December, 1918. The number of Construction Department locomotives was 21 at the end of the year as against 18 in 1918.

MILEAGE OF TRAINS AND ENGINES.—The total engine mileage for the year under review was 5,006,936 as compared with 4,811,657 in 1918, an increase of 195,279 miles, or 4.06 per cent. The train mileage was 3,463,405 as against 3,357,979 in 1918, an increase of 111,426 miles or 3.32 per cent. The increase is due to additional trains running.

The average daily miles per engine actually at work was 108.25 as against 110.11 in 1918.

Fuel.—The following table gives particulars of firewood and coal purchased during 1919.

| | Local weights. | Avoir | Avoirdupois weight. | | | |
|---|----------------|---------|---------------------|------|------|--|
| Description of fuel. | Pkls. Kts. | Tons. | Cwt. | Ors. | Lbs. | |
| Bakau firewood- | | | | | | |
| Converted at a ratio of $2\frac{1}{2}$ to 1 ton of coal | | 65,881 | 11 | 1 | 15 | |
| Jungle firewood— | | | | 204 | | |
| Converted at a ratio of 3 to 1 of coal | | 1,426 | 14 | 0 | 27 | |
| Rawang coal— | | | | | | |
| Converted at a ratio of 1.6 to 1 ton of foreign coal | | 28 467 | 10 | . 0 | 0 | |
| 그 사람들이 가장 보고 있다면 내가 들어 있는 것이 되었다. 그 사람들은 사람들은 사람들이 되었다. | | | | | | |
| Foreign coal | | 2,800 | . 8 | 1 | 8 | |
| | Total | 106,576 | 3 | 3 | 22 | |

Running Costs.—The total running cost per engine mile for the year 1919 was 46 cents (vide abstract C).

Machinery.—The following new machines were installed at Central Workshops during the year:

```
4 Turret lathes
                       4 Shaping machines
Machine Shop ...
                      2 Boring machines
                      12 Turning lathes
                      1 Planing machine
Carriage Shop ... 1 Tenoning machine
Wagon Shop ... 1 Wheel lathe
                      2 Bolt-pointing machines
Coppersmith Shop ...
```

Coaching Vehicles.—No new bogie passenger vehicles were purchased in England during the year, but the bodies of 18 bogie mail type coaches were mounted on underframes received from Japan and turned out. Six bogie mail type coaches were completed, but not turned out, during the year. Twenty-four bogie mail type coaches and one postal sorting van are under construction Sleepers sold during the year were 282,951 compared with at Central Workshops. Two bogie first and second-class carriages,

three bogie second-class and one bogie thirdclass have been fitted with upper bunks. Two hundred and twenty-six passenger vehicles were repaired during the year.

MERCHANDISE MINERAL VEHICLES.—One hundred and fifty covered new goods, 50 fire-

United States of America, during the year. Of these, eight Pacific wood trucks, 50 timber trucks and 100 low sides were built of timber and added to the stock during the year. The following statement shows the cost of these locally-built trucks as compared with the cost of vehicles quoted for delivery from England in 1919:

| | | | eks built timber. | s st | Price que imilar ve eel from neluding cent. for erection | hicles in England 20 per freight | |
|-----|---------------|----------|----------------------|------|---|---|--|
| 100 | Low sides | 2300 | each | | £452 | | |
| 150 | Covered goods | 330 | 22 | | 547 | 33 | |
| 50 | Fuel trucks | 315 | ,,, | *** | 524 | ,, | |
| 50 | Timber trucks | 250 | ,,, | | 420 | ,, | |
| | | | | | | | |

It will be seen therefore that by building these 350 vehicles at Central Workshops and using materials obtained from Japan and Canada, we have effected a saving of approximately:

| 100 | Low sides | | £15,200 |
|-----|---------------|------|-------------|
| 150 | Covered goods | | 32,550 |
| 50 | Fuel trucks | | 10,450 |
| 50 | Timber trucks | | 8 500 |

besides which these 350 vehicles were actually at work earning

revenue during 1919 which would not have been the case if we had

ordered them in England.

Construction Stores.—During the year stores and materials for railway construction were purchased to the value of \$3,594,206.-52, of which the amount paid through the Crown Agents was \$2,956,287.40. Value of the stores in hand at the close of the year 1919 was \$121,296.08. Indents to the number of 22 and estimated value of \$3,171,566.09 were despatched to the Crown Agents.

Construction.—The total expenditure during the year 1919 on construction and surveys of new lines amounted to \$7,655,202.28

as compared with \$2,354,229.38 during 1918.

East Coast Railway: Kelantan Section.—This railway starts from Tumpat and proceeds southwards towards Kuala Lipis in Pahang. The length of this section from Tumpat to Pahang-Kelantan boundary is 108 miles, of which 32 miles from Tumpat to Tanah Merah were opened for traffic on 1st July, 1915. The work on this section, which was stopped in November, 1914, was recommenced in January, 1918, and the progress made is as follows:

The necessary land has been acquired up to $62\frac{1}{2}$ mile. Jungle has been felled for 29 miles and cleared for 24 miles. Nine hundred and seventy-seven thousand six hundred and thirty-two cubic yards of earth work and 16,589 cubic yards of rock have been executed beyond Tanah Merah. The permanent way has been linked

in for $3\frac{1}{4}$ miles.

The expenditure during the year amounted to \$1,423,165.68.

EXTENSION (TO CONNECT WITH SIAMESE RAILWAY).—This railway starts from the south end of Pasir Mas Station on the East Coast Railway, Kelantan section, and runs in a north-westerly direction to the Golok River at Rantau Panjang on the Siamese boundary, a distance of 11\frac{2}{4} miles. Work was commenced in February, 1917, and the progress made is as follows:

The necessary land has been acquired. Jungle-felling and clearing has been completed. Out of an estimated total of 848,183 cubic yards of earthwork, 793,976 cubic yards have been executed. The masonry of 18 bridges is completed and of five in progress, and the steel work of one bridge is also in progress. The permanent way has been linked in for 11½ miles, lifted and packed for 11¼ miles. All the buildings on this line have been completed.

The expenditure during the year amounted to \$520,205.61.

East Coast Railway: Pahang Section.—This railway starts from Tembeling and proceeds northwards towards Tumpat. The length of this section from Tembeling to the Pahang-Kelantan boundary is $70\frac{3}{4}$ miles and the progress made on construction is as follows:

Land has been acquired to the Pahang-Kelantan boundary. Jungle has been felled for $48\frac{1}{2}$ miles and cleared for 40 miles. Out of a total of 9,446,949 cubic yards of earthwork, 5,628,894 cubic yards of earthwork and 616,070 cubic yards of rock have been executed. Out of 337 bridges and culverts provided, 116 are completed and 12 are in progress. The permanent way has been linked in for $32\frac{1}{2}$ miles and lifted and packed for 25 miles.

The line from Tembeling to Kuala Lipis (117th to 1413 miles from Gemas) was handed over to open lines and opened for traffic

on 15th October, 1917.

The expenditure during the year amounted to \$2,188,164.00.

Perlis Railway Extension (to Connect with Siamese Railway).—This railway, which starts from Alor Star, the capital of Kedah, and runs through Perlis to Padang Besar on the Siamese frontier, over a length of 42 miles, was completed with the exception of eight bridges and was opened for traffic on 1st March, 1918. The steel tops for these eight bridges, which were not delivered from England owing to the war, are now being received and the temporary trestle bridges being pulled down and replaced by steel tops. Certain buildings were also erected during the year at Padang Besar on joint station account.

The expenditure during the year amounted to \$65,869.06, but a credit to the amount of \$138,387.48 was received from the Siamese Government on account of their half share of works done by this department at the joint station.

Prai Doubling, Wharves, Alterations and Additions, and Purchase of Land.—The doubling of the line from Prai to Bukit Mertajam, a distance of 6 miles and 42 chains, together with sidings and buildings, were completed and handed over to open lines on the 24th May, 1918.

Out of an estimated total of 551,342 cubic yards of earthwork,

467,163 cubic yards have been executed.

CAUSEWAY ACROSS JOHORE STRAITS .- The contract for the construction of the causeway crossing the Straits of Johore between Johore Bahru and Woodlands was let to Messrs. Topham, Jones and Railton, Limited, in June, 1919, the time allowed for the completion of all the works being 51 years. Up to the end of the year the work was almost entirely of a temporary character and considerable progress had been made in the preparation of plant, and the erection of shops, offices, staff quarters and cooly lines, etc. Ten hopper barges for the conveyance of stone from the quarry to the causeway were ordered in England. Four have been delivered and are under erection at Singapore, but had been delayed on account of shipping difficulties and labour troubles and were not completed at the end of the year. One large steam tug has arrived from England and another is on order, while a smaller tug and a steam launch were bought locally. The opening up of the quarry at Pulau Ubin has proceeded very satisfactorily and it is now in a position to begin the supply of both rubble and crushed stone for the works. Permanent work has been begun on the construction of the lock at Johore, and is proceeding satisfactorily. The expenditure during the year amounted to \$747,208.91.

Railway Facilities at Harbin

WRITING from Harbin in September, U. S. Trade Commissioner Batchelder says that ample freight and passenger services connect Harbin directly with Mukden, Dairen, and Tientsin through the South Manchurian and Peking-Mukden railroads, and with Yokohama, through the railroad systems of Korea and Japan. Sleeping cars and dining cars are attached to many of the trains. Regular daily trains with sleepers run between Harbin and Vladivostok.

The freight equipment is also adequate to handle an addition of 50 per cent. to the existing traffic, and there are 9 unused American locomotives, besides many idle freight and passenger cars. About 150 of the latter are being used as living quarters, the majority having come from the Russian railroads. The improvement in conditions is largely due to the efforts of the Allied Technical Board, under the presidency of Mr. J. F. Stevens. It has spared no pains to secure freight from shippers of beans and other commodities, and has in some cases moved freight cars 1,000 miles in five days.

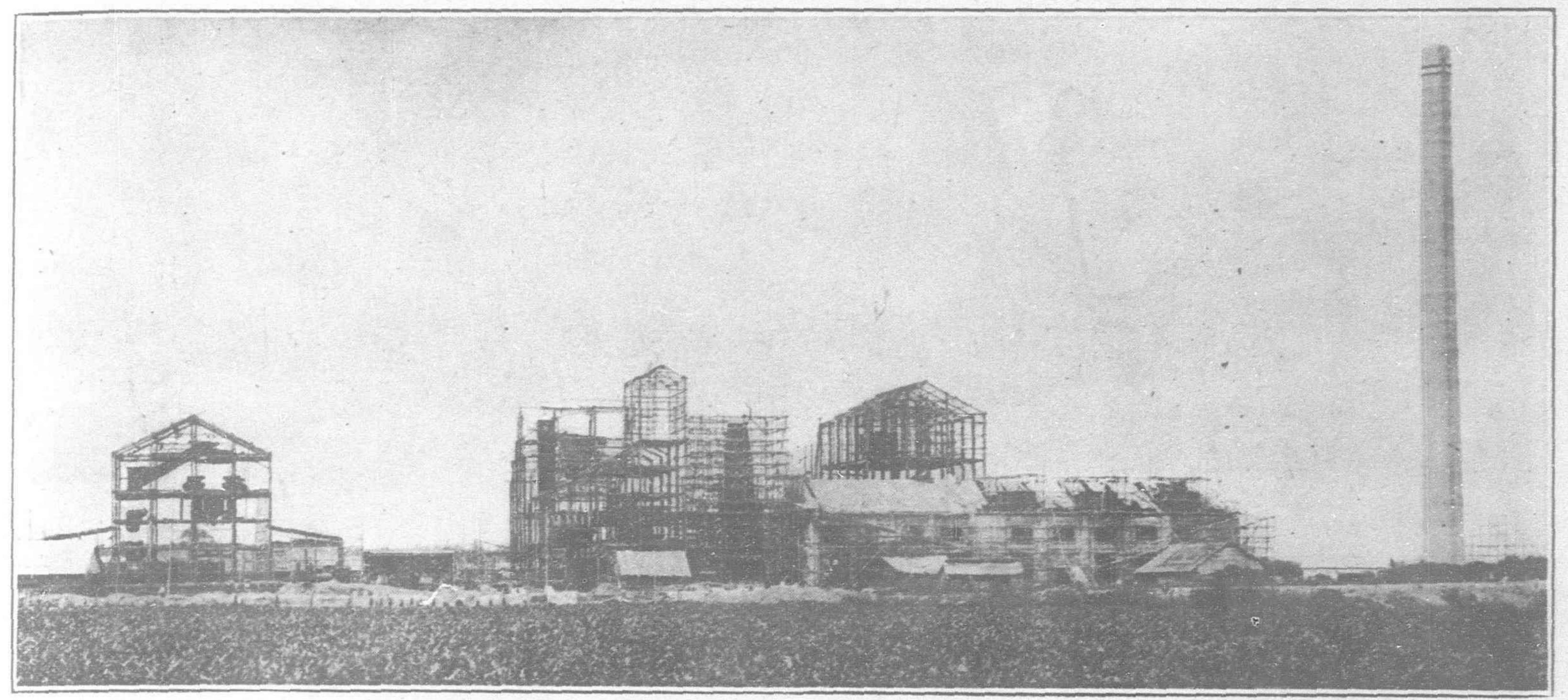
The result of these methods, when applied to railroads free from military control, is shown by the following table of cars loaded and moved during the months mentioned: January, 180; February, 232; March, 262; April, 254; May, 340; June, 455; July, 482.

If the traffic were to increase materially, there are numbers of cars and locomotives which could be repaired for service.

Since 1918, however, there has been but little regular freight traffic over the Trans-Siberian Railway, and for some time through traffic has ceased owing to military operations. It is alleged that regular trains are running from Irkutsk to Moscow.

Since the difficulties of the Chinese Eastern Railroad have been remedied, the impediments to trade are merely political, though if transportation were to begin to the interior of Siberia, the Chinese Eastern Railroad would need new equipment of many kinds—ties, rails, and many other items of maintenance. It is probable that the requirements of the other portions of the Trans-Siberian system would be even greater.

It is interesting to note that the train service is being carried on exclusively by Russians, and that they have profited by the training given them by the American railway engineers.



The Plant of the Hokkaido Sugar Company under erection at Obihiro, Tokachi Prefecture, Japan

American Beet Sugar Factories in Hokkaido

T Obihiro, Tokachi Province, is located the new beetsugar plant of the Hokkaido Seito Kaisha, which
started operations in November. In the fields ten
thousand acres of sugar beets await transportation
to the mill whose capacity is six hundred tons of
beets per day.

The climate of this part of Hokkaido greatly resembles that of Colorado and Wyoming, where beet growing has been very successful. In this locality it was found that the beets developed to a very large size, and contained a high percentage of sugar. In 1918 four hundred acres of beets were planted, resulting in a yield of fourteen tons per acre, averaging 15.9 per cent. sugar; and in 1919

the same number of acres were planted, which produced a yield of fifteen tons per acre testing 15.2 per cent. sugar.

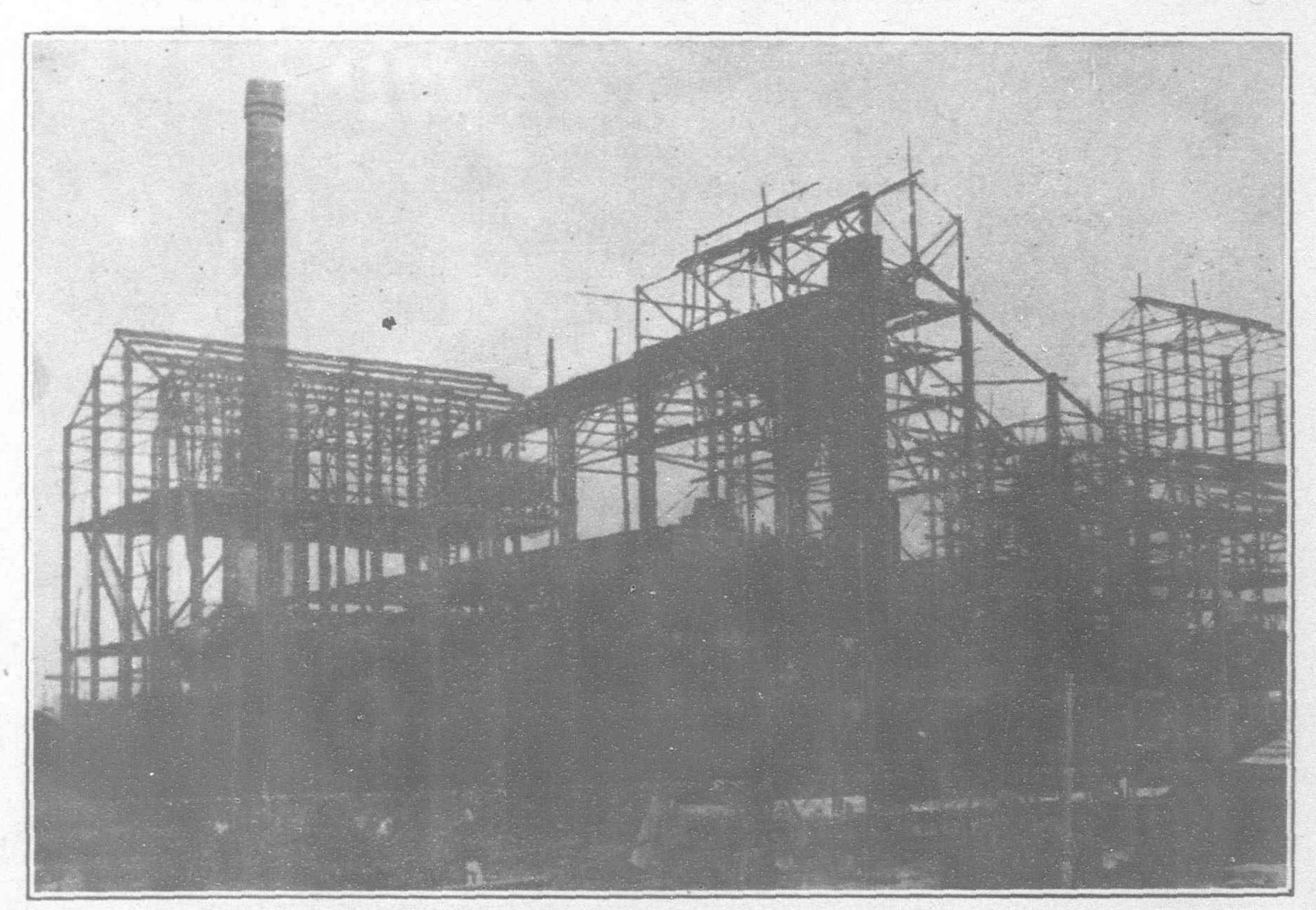
In June, 1919, the Hokkaido Seito Kabushiki Kaisha was organized, under the presidency of Mr. Masakuma Matsukata, wellknown sugar man in Japan, and the managing directorship of Mr. S. Makiyama, another well-known Japanese sugar Men expert. were despatched to the United States to study conditions farming and beet-sugar

making, and the most up-to-date machinery procurable was purchased and shipped to Japan. At the same time work was started in the vicinity of Obihiro preparing the fields for a beet crop the following summer, and ground was broken for the new plant at a point two miles southwest of Obihiro. This plant covers approximately one hundred acres of ground. It consists of one main factory building in which is housed most of the machinery, power plant, etc. In addition to this are a boiler house, lime kiln (steel construction), Steffens house in which takes place the final reduction of the molasses, the pulp drier, and a number of warehouses. The main building is four story, 181 by 69 feet. All buildings are of steel and reinforced concrete construction except the warehouses,

which are brick and stone. A complete machine shop is also attached to the plant.

The entire plant was furnished by the Dyer Company of Cleveland, Ohio, through their agents, the American Trading Company.

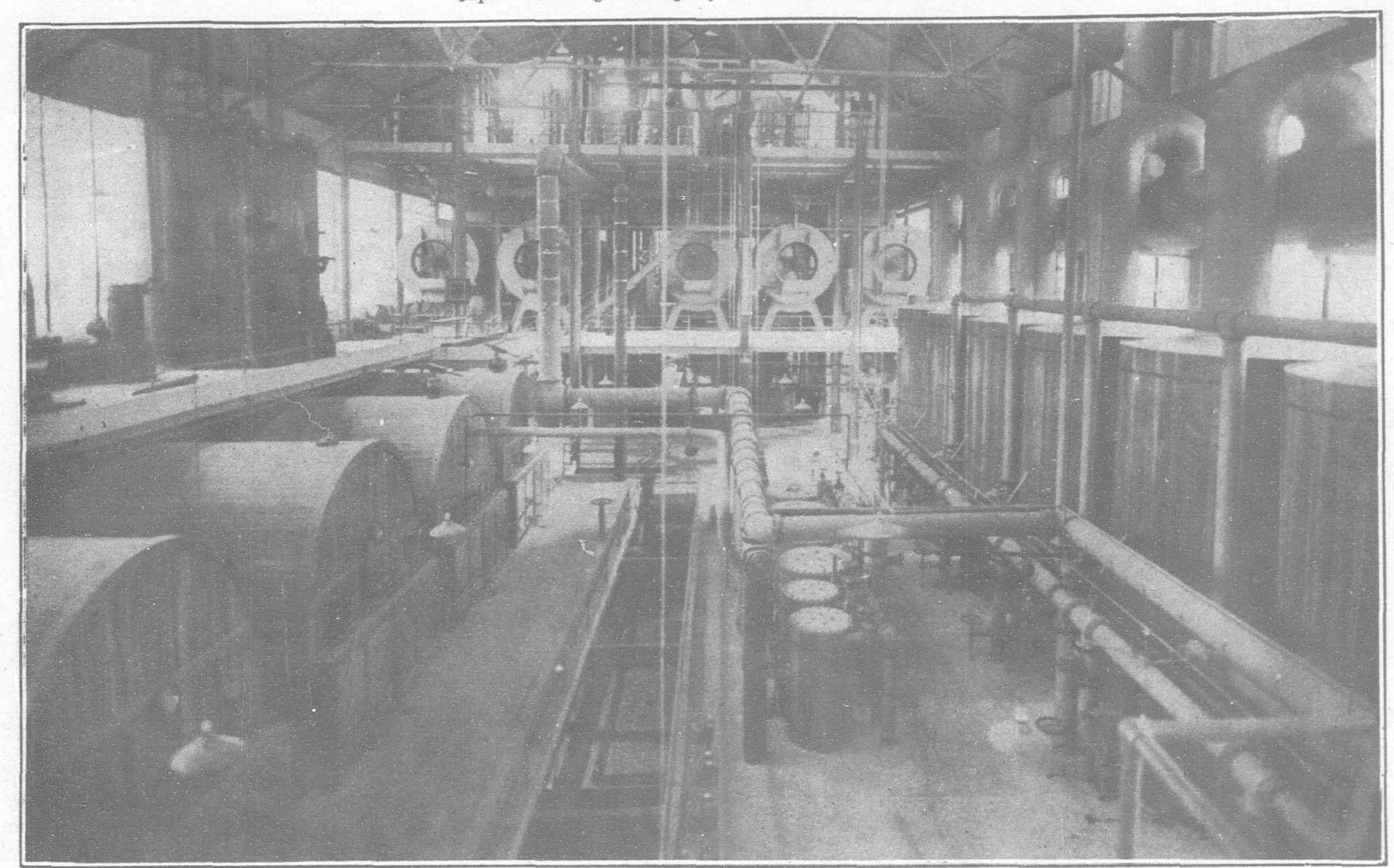
The company has built sufficient barrack-houses and residences to house all employees. Specially constructed have houses been erected for Korean employees. There is also a company store and company staurant where



Another view of the New Beet Sugar Plant under erection at Obihiro, Tokachi Prefecture, Japan

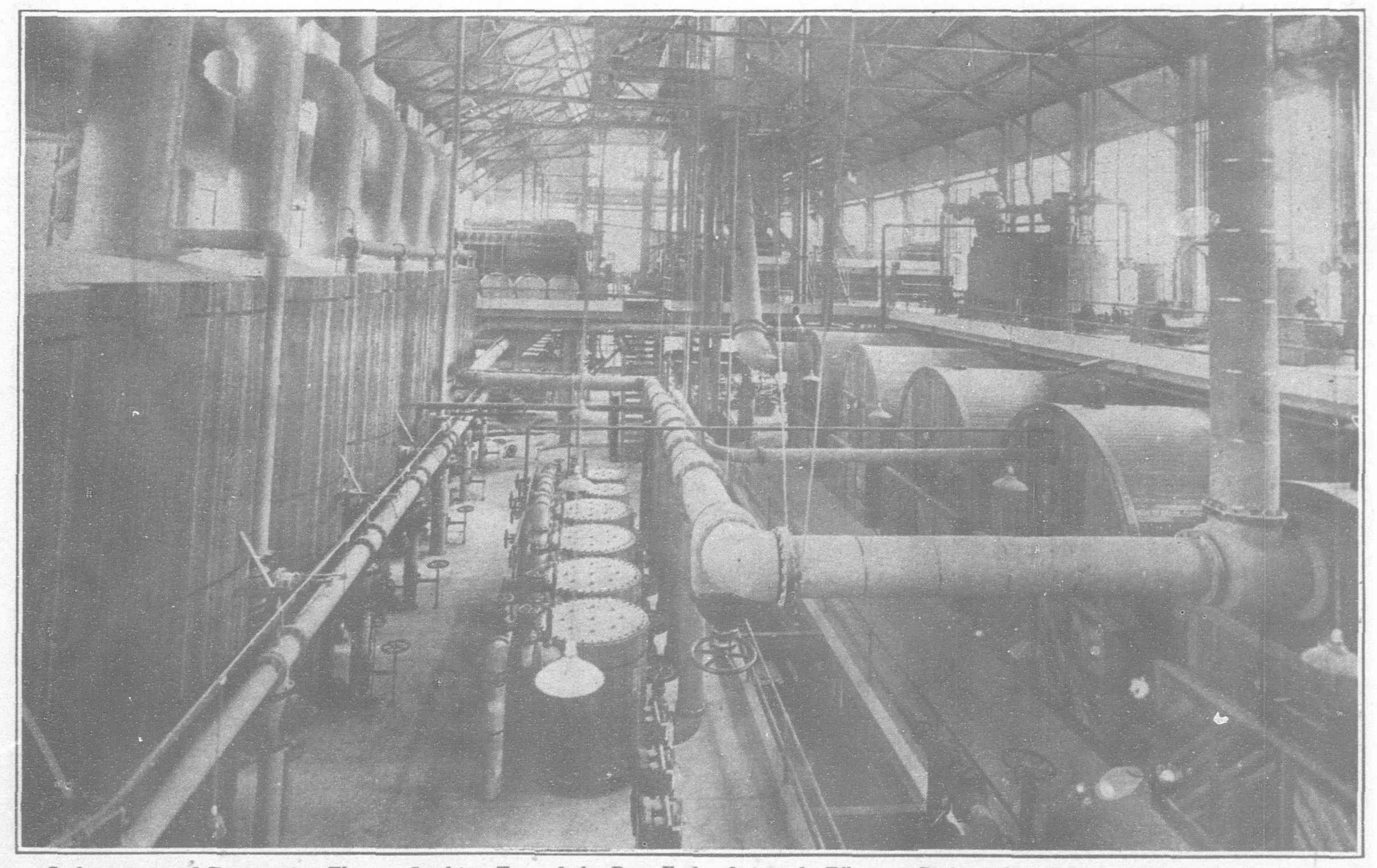
AMERICAN BEET SUGAR FACTORIES IN JAPAN

Interior of the Hokkaido Sugar Company's new 600-ton Plant at Obihiro in Hokkaido. A similar plant is being erected by the Japan Beet Sugar Company at Shimizu, Hokkaido

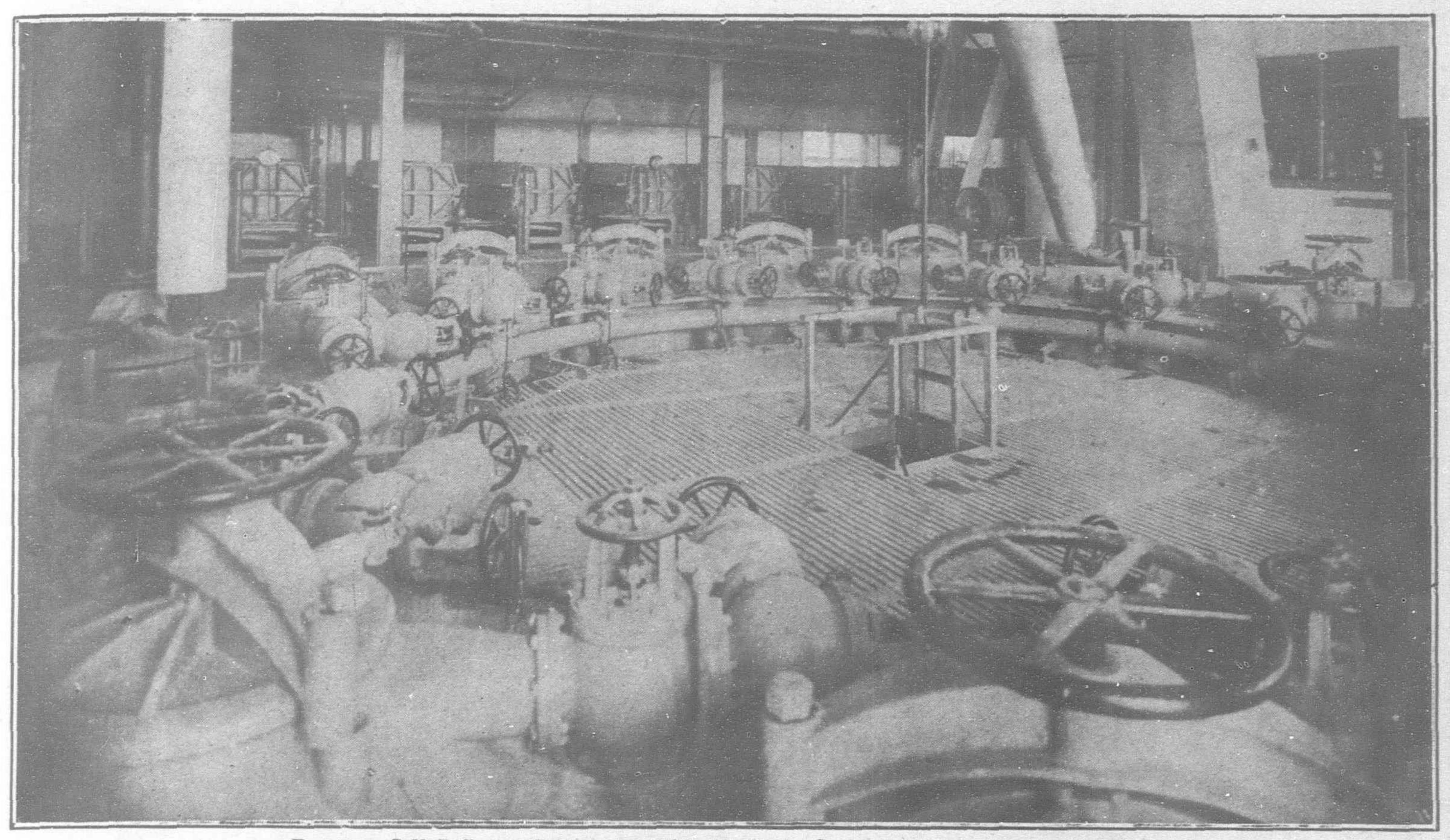


Carbonation and Evaporating Floor: Looking Toward the Sugar End of House. Horizontal Quintuple Vacuum Evaporators to the Left.

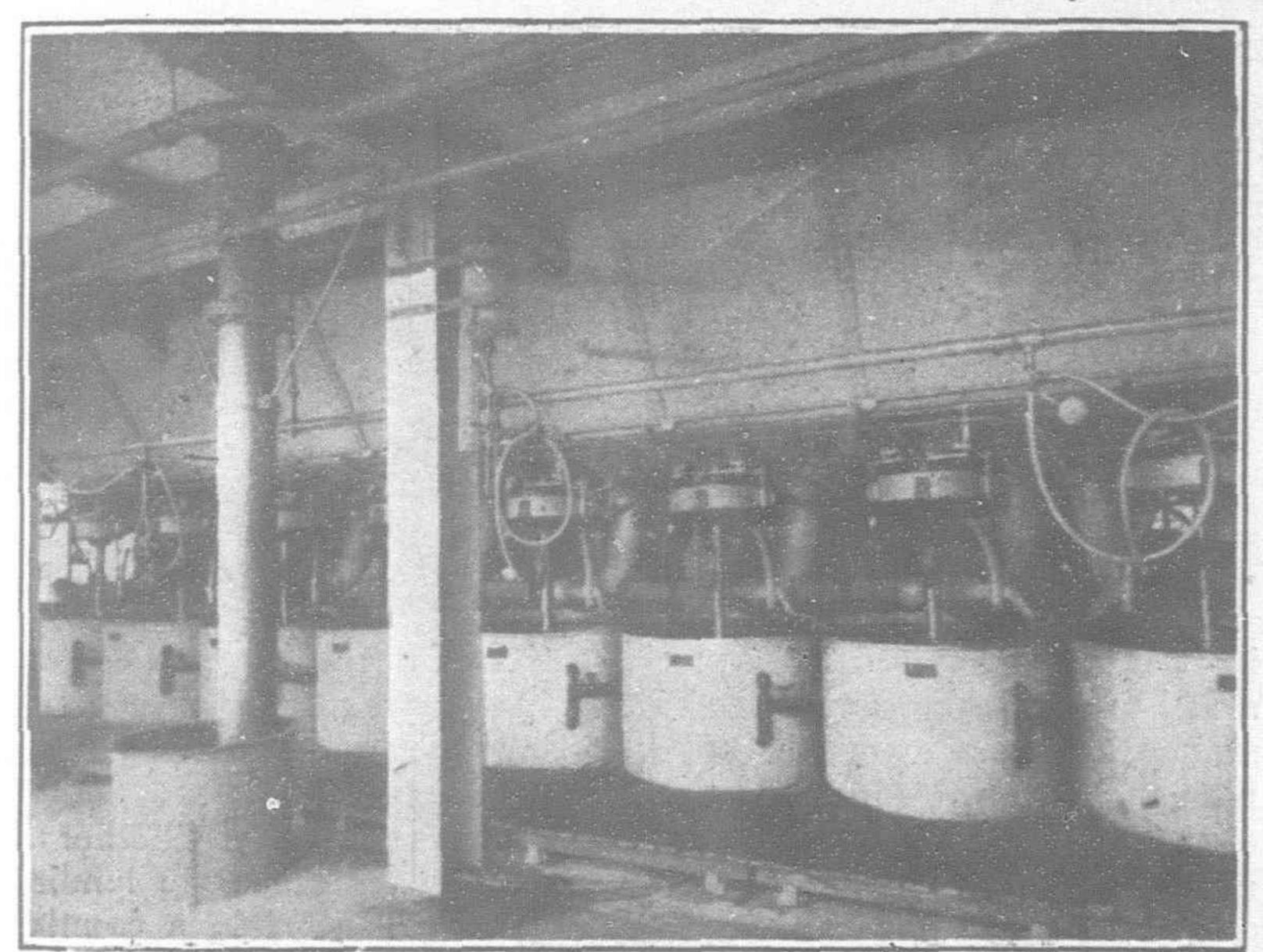
Carbonating Battery to the Right. Vacuum Pan and Crystallizers to the Rear



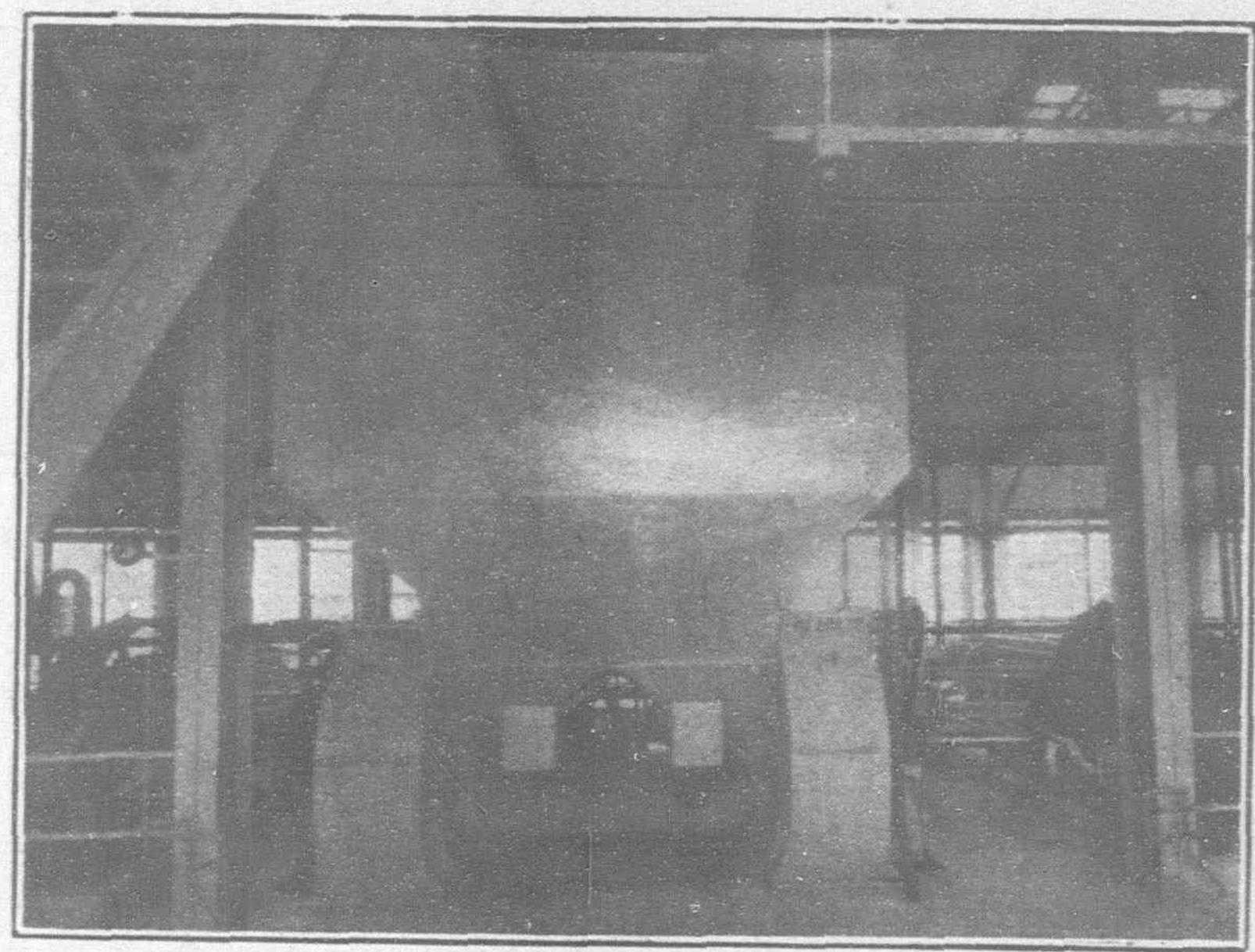
Carbonation and Evaporating Floor: Looking Toward the Beet End. Quintuple Effect on Right and Carbonating Battery to the Left



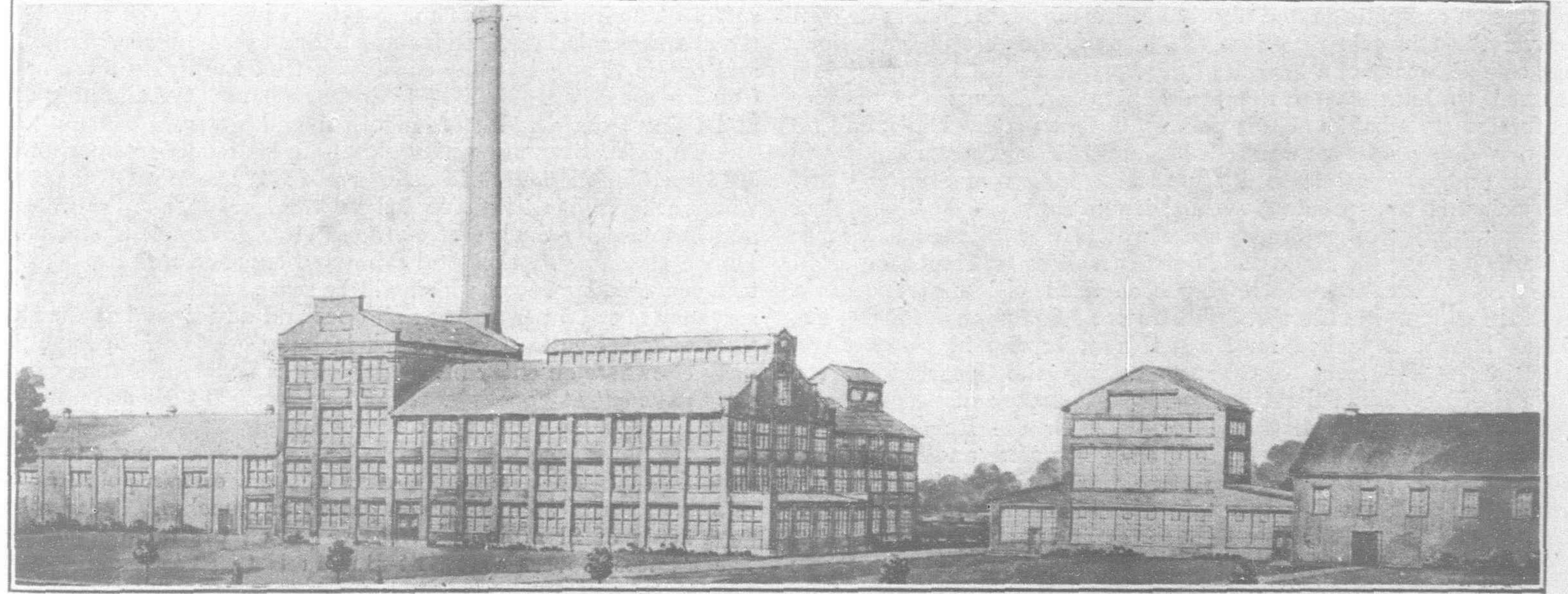
Fourteen Cell Diffusion Battery in Hokkaido Sugar Company's New Plant at Obihiro



Centrifugal Battery and Mixer



Beet Slicing Machine in Hokkaido Sugar Company's New Plant at Obihiro



General View of Dyer & Company's Standard 600-Ton Beet Sugar Plant erected for the Hokkaido Sugar Company and the Japan Beet Sugar Company by the American Trading Company

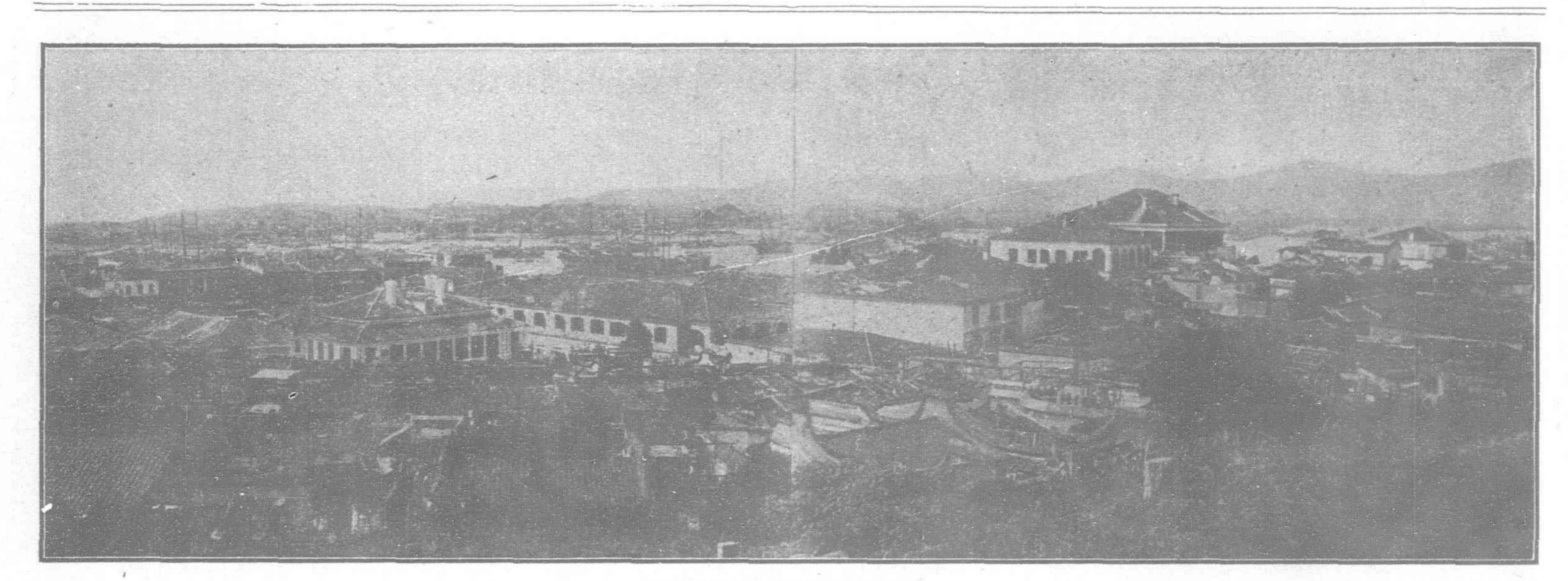
employees may buy commodities or meals. On the premises also is a fine club house, at which visitors or officials of the company are housed when visiting the plant.

Fifty-five miles of private railroad, narrow gauge, are being constructed, thus eliminating the long haul by wagon or cart to the mill. The rolling stock of the company consists of four small locomotives and two hundred and fifty beet cars.

Of the ten thousand acres planted this year, the company cultivated two thousand, five hundred acres, and private farmers the remaining seven thousand, five hundred acres. Officials of the company expect the total plantings next year will reach twenty thousand acres.

An exact duplicate of this mill is being constructed at the town of Shimidzu, a few miles from Obihiro. This plant will be ready for operation in the fall of 1921, and the officials of that company expect to have ten thousand acres of beet land under cultivation next year.

The Hokkaido Seito Kaisha in the clearing of the new land and its preparation for next year's crop, are using one 75 h.p. Caterpillar tractor and three 40 h.p. tractors of the same type. All the modern farm machinery to go with these tractors is being used.



THE CITY OF FOOCHOW

Foochow Port Development

Western Engineering Skill Training One of China's Wayward Rivers How to Behave

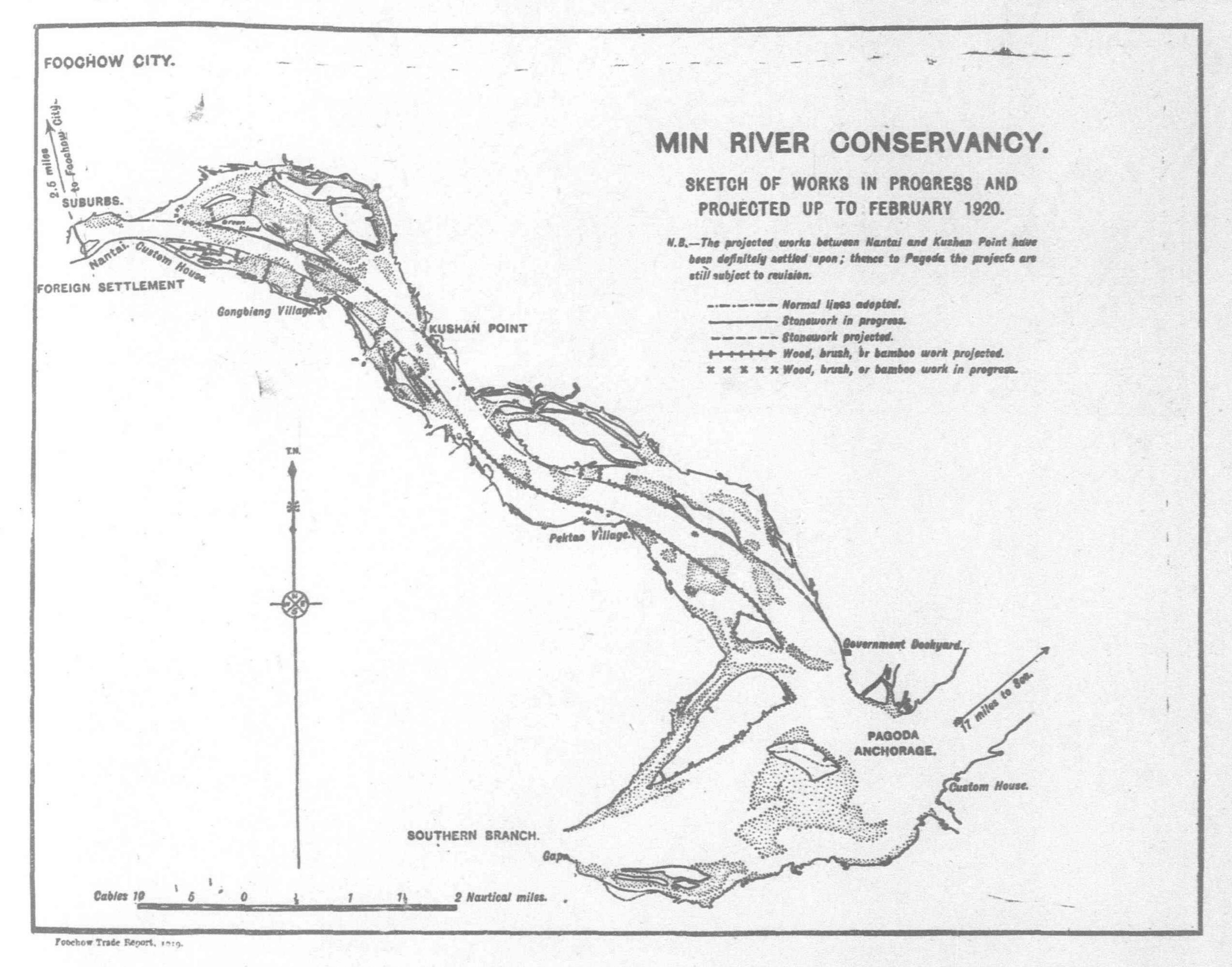
UBSTANTIAL progress has been made in the important work of training the Min river so as to provide Foochow with a safe modern harbor. During 1919, this port made four new records—in the number of vessels entered and cleared, in the value of exports to other Chinese ports and in its exports of timber and of camphor.

Commissioner of Customs Thomas Ferguson, in his annual report just issued by the inspectorate of customs, says that "tea," once Foochow's "premier staple and now to all appearances doomed by foreign competition and discriminating tariffs, is holding its own bravely." Of local enterprises which mark the year under review, the establishment of a branch of the Banque Industrielle de Chine, opened to business on the 8th September, brings the number of foreign-style banks at this port up to four regular banks and an agency doing a more limited business. The Foochow Electric Light Company established a powerful ice-manufacturing plant (capacity, 10 tons per day) with a view to supplying the large fleet of fishing-junks operating in these waters with cleaner and more durable ice than the muddy and quickly melting substance imported from Ningpo. The price having been fixed as low as 2 cents a pound for domestic use and 3 dollars per 1,000 pounds for fish ice, much benefit is looked for from this enterprise in many ways. An interesting local occurrence during the year was the arrival of an Italian flight-officer for the purpose of selecting and preparing an intermediate landing-place for the Rome to Tokio flight. After considerable trouble, one place after another proving to be unsuitable even if given some weeks' preparatory work, a rather small site was finally obtained and made ready. The object lesson of this is the following: if at the capital of a province, situated in a wide alluvial plain, it is impossible, even with the sympathetic

interest and promised assistance of the chief authorities, to prepare a fully suitable landing-place except at great expense in time and money, China is evidently not the country for the ordinary aeroplane. With every inch of level ground ploughed up and cultivated or marshy and soft, it would be a matter of grave doubt whether an aeroplane could make good an unexpected intermediate landing anywhere without sustaining serious damage. And in a country where ordinary roads are still non-existent it is not likely that properly prepared landing-sites will soon be found and prepared in sufficient numbers to be of much general use. On the other hand, rivers and canals, lakes and lagoons abound throughout the country, and one is thus led to the conclusion that the flying machine for China is some sort of a light hydroplane capable of alighting upon and rising from any bit of smooth inland water.

THE MIN RIVER CONSERVANCY.—In his report on Foochow for 1918 the Commissioner of Customs said: "The Min River Conservancy scheme has been adopted by the local mercantile interests and has received the assent of the Chinese government and of the Diplomatic Body. The total estimated expenditure of \$900,000 is to be covered by a loan which will be served and secured by a conservancy tax of 5 per cent. on all dues and duties paid at the Maritime and Native Customs, which includes goods which have paid duty elsewhere on entry into China and are exempted from further duty payment at Foochow. Steamers over 500 tons, ascending the river to Foochow itself, pay a tax of 5 cents a ton, while vessels of under 500 tons pay 3 cents a ton. There is also a tonnage tax on all sea-going junks ascending the river above a certain point, as well as a fixed tax of \$5 a month on passenger launches. A cargo-boat pays a tax of \$1 a month; treasure pays \frac{1}{2} per mille ad valorem. The Chinese Government Salt Bureau is to pay an annual conThe actual local government contribution is \$18,000 a year. It is estimated that the annual income to be derived from taxes and contributions will not be less than \$90,000. The work is to be completed within three years from commencement, although it is believed that actual results will be apparent considerably before this. The collection of the taxes and the financial transactions are vested in the Commissioner of Customs. The actual administration will be in the hands of a committee of three, a Chinese government representative, a representative of the local Consular Body, and the Commissioner of Customs. The object is to admit of coasting steamers of 16 to 17-ft. draft ascending the river right up to Foochow, thus avoiding the double transhipment at present necessary. The harbor space at Foochow is ample and can even be

an engineer engaged to take charge of the execution of the work. After another thorough survey of the river and a great amount of unavoidable preliminary work in the way of organization, equipment, finding suitable materials, etc., appreciable stretches of training and shore protection works are already in evidence. It is the intention to bring about the decided improvement in depth by means of a training system only—i.e., without dredging,—which will narrow down, regularise, and confine the flow of the river, both in the discharge of its up-country drainage and in its accommodation of the flood and ebb currents induced by the sea, between normal lines, stabilised where necessary by means of works such as leading dikes, shore protection, groynes or spurdikes, closing dikes, etc. On the accompanying sketch-map will be seen where these works are projected and how far they have pro-



increased, if necessary, by an extension of the present limits. The construction of wharves will have to follow as a natural course as soon as visible results are attained, but in this the shipping companies will have to study their own convenience. The proper lighting of the river will have to be undertaken as the work proceeds. In one respect, at least, Foochow can claim to be ahead of other ports and to be congratulated: the scheme only took six months after its adoption locally to pass through the customary diplomatic channels and receive official sanction. The usual length of time, judged by other places that have undertaken conservancy work, may be measured by years."

Commissioner Ferguson, in his present report, says that "it is now gratifying to be able to chronicle an unremitted progress in this scheme during the year under review. The taxation system was put into force on the 3rd March, 1919 and a few months afterwards

gressed up to date. Two important features which may be noticed at the present stage are, in the first place, the fact that to all appearances so far the river bed will allow of stone works to be built up without foundations of brushwood, except, perhaps, in a few of the worst places, which will very favorably affect the speed and cost of construction, and, secondly, the existence of, and consequently some facilities in the procuring of material and skilled labor for, a local system of river training works in the shape of 'planted bamboo,' i.e., bamboo poles from 1½ inches diameter down are struck into the river bed at a distance of 6 to 8 inches so as to form long screens of a width of about 10 feet. This is what in hydraulic terms would be called a 'permeable dike,' but of such an extraordinary degree of attenuation as would probably never be ventured upon by a foreign engineer without this native example and the ocular proofs of its efficacy. As an offset to the two favor-



Foochow, the capital of Fukien Province, lies on the Min River, 34 miles from the sea, in lat. 26 deg. 20 min. 24 sec. N. and long. 119 deg. 20 min. E., about midway between Shanghai and Hongkong. Foochow is nearly opposite Tamsui, in Formosa, with an arm of the sea between. The foreign settlement is on the opposite side of the river from the native city. Between the native city and the foreign settlement is a small island in the stream which serves as a base for an ancient stone bridge, which connects the settlements.

able features given above might be mentioned a great difficulty in procuring the necessary materials in sufficient quantities and speed of delivery to keep the work going with a fair degree of intensity. Labor seems easy to procure, but, again, our local contractors are apt to be apathetic and unenterprising where jobs are involved of sizes to which they are not accustomed. For most of the work lends itself to execution by sectional contract for material, labor, or both combined, and so far there seems to be very little need to resort to importation of either from elsewhere. On the whole, however, there is every reason to look forward to a steady and effective progress of the scheme and consequent accomplishment of the aim in view, viz., the elimination of lighterage at Pagoda Anchorage for all cargo that can be brought into the port in steamers drawing up to 17 feet. It should be borne in mind that the above scheme only takes account of the navigational approaches of the port. An incidental benefit will be the reclamation of great tracts of sandbanks and their ultimate recovery for cultivation, all within the radius of the present scheme. Should the Conser-

vancy later on wish to turn its attention farther afield and, with the advantages of its established organization, technical experience gained, prestige, etc., take in hand some of the higher and back reaches of the river for the benefit of the husbandman, a vast potential field of the most valuable activity in the way of reclaiming and protecting land for cultivation lies ahead of it."

Population of Japan 77 Millions

Tokio, Dec. 19.—The population of the Japanese Empire, according to the final figures given by the census board, is 77,005,510, made up as follows: Japan proper, 55,961,140; Korea, 17,284,207; Formosa, 3,654,398; and Saghalien, 105,765. In Japan proper the population comprises 28,042,995 males and 27,918,145 females, giving a density of 2,239 to the square li. There are 16 cities with a population of over 100,000 each.—Reuter

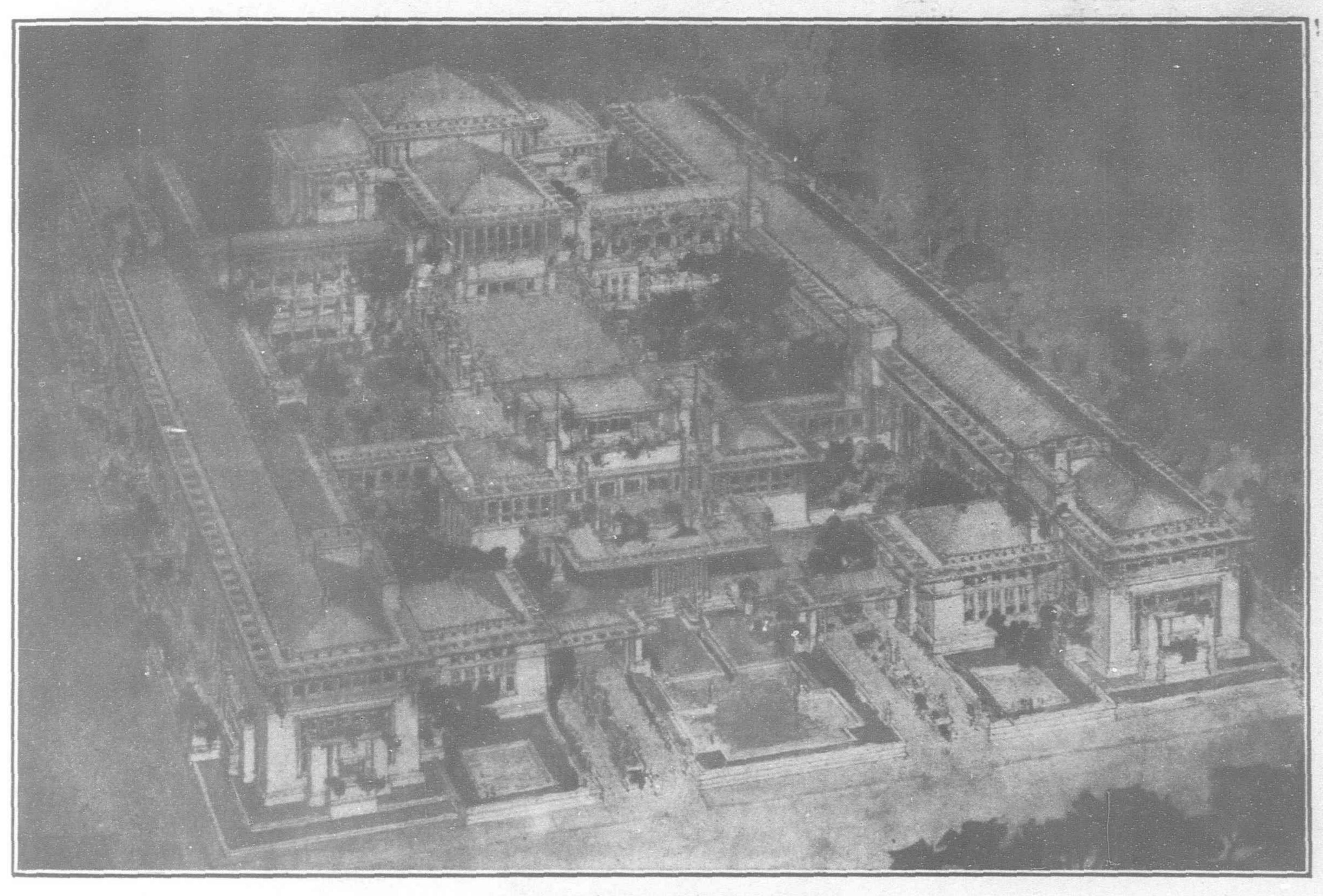
"The World's Finest Hotel"

Tokyo's Magnificent New Structure Designed by an American to Typify the New Spirit in World Architecture

NOTHER instance of Japanese-American co-operation is seen in the designing and construction of the
new Imperial Hotel in Tokyo. It is characterized by
Mr. Frank Lloyd Wright of Chicago, the architect,
as the "finest hotel in the world in point of
character—a complete fireproof organic structure embodying the
best and most advanced thought of the time in all its features."
The design of the new hotel is a complete departure from all other
accepted plans and a welcome variation from the medley of nondescript foreign structures hitherto erected in Japan from the plans
of architects reflecting the obsolete styles of their various countries

hotel building faces, will lead to a supplementary section containing exhibition galleries, club rooms, billiard rooms, a lounge for men and one for women and various other features, which will furnish an elaborate and extremely comfortable rallying point for the social activities of Japan's capital. Other features will be open air arbors where one may dine in private when the weather makes this desirable. A fine Turkish and Russian bath, with a 20×60 feet swimming tank, is included,

The interiors will be carried out in permanent materials, such as brick, bronze and marble, in a style characterized by breadth, strength and simplicity, all utilitarian needs being met directly, in



"THE WORLD'S FINEST HOTEL."

or schools. The new Imperial is designed to carry out the note of simplicity and sincerity in order to help teach Japan a new lesson in Western civilization in aspects that are considered vital.

The general view of the new building will help to convey some idea of this remarkable new structure, whose predominating feature is seen in the theatre and huge banqueting hall in the rear. The building will contain 300 guest rooms, each with a bath. The main building will hold a banquet hall of great beauty, capable of seating at table 1,000 persons, a grand dining room opening out to interior court gardens on two sides, private dining rooms of all sizes, a theatre, or cabaret with revolving stage, roof garden, etc., while a side entrance from the street which the present

appropriate form and with appropriate materials, without overornamentation.

Heating, lighting, water system, furnishings, etc., will all be incorporated in the building itself. Heating, lighting and cooking will be done by means of electricity, the equipment being designed to handle 2,000 guests at one time. Although the hotel is designed by an American, all materials, with the exception of probably hardware and mechanical appliances, will be made in Japan. The edifice will be of yellow pressed brick trimmed with a special cream-colored lime spotted stone.

An important part of the hotel is the boiler room and laundry. Twenty feet under the new building is a cistern from which will come the water for the laundry. A system of pools will catch the rain water which falls in the hotel property and this water will be drained to the cistern. This water will be filtered and used throughout the hotel for bath purposes. Near by is located an Artesian well and over it is a big pressure tank which holds 30,000 gallons of water. Under the main dining room, between the Hibiya Park entrance and the entrance on the east, will be the swimming pool.

South of the laundry and boiler room is the septic tank where the sewage of the hotel will be carried, there to be chemically treated before drained into the canals of the city.

Mr. Hayashi, the manager, has planned a group of cottages

which will be constructed in semi-studio architecture to be leased to the foreign residents of Tokyo. They are to be built on the two sides of the Japanese gardens which are to be one of the beauties of the new establishment.

The main entrance of the hotel will be on the Hibiya Park side and from the main entrance to the cabaret dining room will be a good sized lobby. Near the dining room at the east end will be the promenade and over the main dining room in the centre of the building will be a roof garden where tea will be served during many of the months of the year. Beautiful landscape gardens are being planned.

The Mint of the Philippine Islands

HE new mint of the Philippines was officially opened for coinage on July 16, 1920. The most protein that was struck from the dies at the opening of the new mint was this souvenir medal, made of gold, silver and bronze, to commemorate the occasion. Or the obverse side of the medal is a profile portrait of President Wilson, and on the reverse side a figure represents Liberty protecting and instructing the new beginners in the operation of coining machinery, at the same time holding in her right hand the weighing scale to demonstrate the absolute necessity for carefulness and exactness in every operation which all mint work demands. This medal was designed by Clifford Hewitt, technical mint expert, who has installed and instructed the personnel in the

operation of a mint. The mint is sufficiently large to take care of the Philippine coinage of bronze, nickel and silver, and has an annual capacity of 25,000,000 coins, or a possible daily output of 85,000 pieces, figured on a basis of eight working hours per day. The appliances of the mint are of the very latest design, and the most modern methods of operation have been adopted. All the machinery is electrically driven, each machine having its own individual electric

motor of the alternating type. The largest motor is 50 H.P. of a total of 175 H.P. This installation consists of 20 motors in all.

One of the first installations required in a mint is an assay department, for the purpose of assaying all bullion received as deposits; to determine the fineness in order to make accurate payment to depositors of metal, also the same assaying of all ingots for coinage purposes, to insure that the legal fineness is always maintained in the coins.

This assay department is equipped with the latest design gas-fired cupel muffel furnace, will cut four one centavo coins at one stroke. The speed of this one large oil-melting furnace, cupel forming machine, bottle agitator, assayer's fine balance, one 3,000 oz. bullion balance, acid laboratory equipment, including all glass jars, bottles and testing devices.

There is another very important department in connection with a mint. Electrolitic refinery is a process of refining precious metals which consists of positive and negative electric currents flowing from the annode to the cathode, which are suspended in a procelain tank containing the solution. This process of refining is the most modern and economic method of refining precious metals.

The installation consists of one electric motor generator set with switchboard and special wiring of 500 amperes at 5 volts, one oil-melting furnace, annode and cathode moulds, soapstone tube laboratory testing outfits, one 3,000 oz. balance and accessories.

The assay and electrolitic refinery departments in conjunction with the mint will be very much appreciated by the banks, jewelry trade and mining interests. It will also have a wonderful effect on stimulating mining of gold and silver throughout the islands, as the mine owners will be able to get correct assays of all samples

of ore. All gold that is refined there in the islands is done at present with what is known as the cyanide process of refining and the gold refined by the method is of a low fineness, but by the improved method of electrolitic refining it is possible to refine gold and silver to a fineness of 999.9 plus.

The melting department of the mint consists of 5 oil-melting furnaces, one ingot topping machine, filing benches, ingot moulds, cooling tanks, stamping tables, pouring cups, stirrens; tonge and minor equipment. The output of each melting furnace figured on an eight hours a day basis on silver melting would be 2,040 pounds of metal melted per furnace, consumption of fuel oil 64 gallons or about 12 gallons of oil for every hundred pounds of metal melted. A No. 70 graphite crucible, holding approximately 412 pounds of metal, is melted in the furnace. A specially designed settling chamber for melting furnaces has been built which recedes silver-melting losses to 3 of an oz. on every 1,000 oz. melted. The greatest losses or wastage in a mint are eliminated to a great extent by careful supervision and a modern melting equipment.

The rolling and cutting department of this mint consists of 2 50 H.P., electrically-driven rolling mills of the most modern

type, fitted with hardened steel rolls. They are equipped with a patented roll adjustment, whereby the rolls can be adjusted to one ten thousanths of an inch. By this accurate adjustment of the rolls there is no difficulty in rolling a perfectly uniform strip of silver that when planchets are cut from this strip, they will be within the legal tolerance of weight. This system of accurate rolling eliminates a great amount of light condemned pieces. The cutting presses where the planchets are punched out of the strip, are also automatic. The press



P. I. MINT COMMEMORATION MEDAL

press is 175 R.P.M.

The planchets annealing and cleaning department consists of an automatic rotary annealing furnace, gas or fuel oil. All the coin blanks are run through this furnace to be annealed at a temperature of 1,400 degrees farenheit, as continual rolling hardens metal and the annealing restores the original softness to the coin blank. In the process of annealing the coin blanks become oxidized or tarnished. This oxidization is removed by rumbling and burnishing the blanks in a special rotary washing machine, in water and compound. By this operation, it restores the original lustre to the metal. The blanks are then put into a centrifugal coin dyer, which has a hot air attachment and revolves at a speed of 1,000 revolutions per minute, and which extracts all moisture. The coin blanks are now perfectly dry, and will not tarnish.

The press, or coining department is equipped with two of the latest and most modern coining presses. They have a speed of 90 pieces per minute and will coin from a ten centavo to a silver dollar of 1½-in. diameter at a pressure of 180 tons. These presses require no operators, they are entirely automatic and all that is



THE MINT BUILDING, MANILA, P.I., WHERE PHILIPPINE CURRENCY IS COINED.

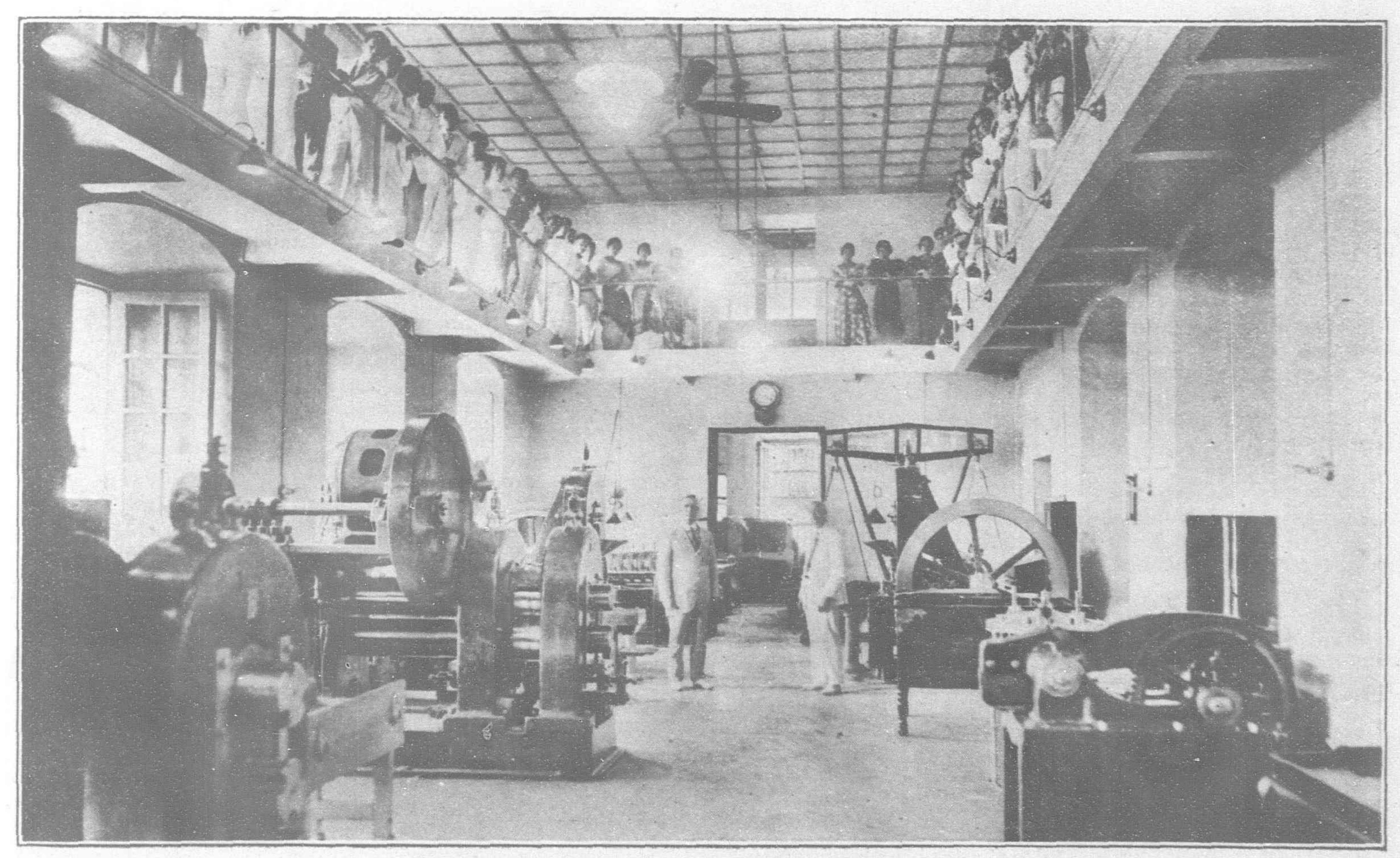
The upper portion of this building was seriously damaged by fire, recently. Fortunately, the fire was controlled and extinguished without injury to the mint plant described in this article.

necessary to do is to start them and through an electrical automatic device, the press will stop automatically when the last coin is struck by the die. These coining presses are equipped with automatic coin feeding devices. All that is necessary is to fill the hopper mounted on the front of the press and the finished coin drops out of the side of the press into a box.

The last operation that all coins pass through is the counting department, for every individual coin is counted on what is known as the counting board, which counts 500 coins at one time. Coins are put in bags at the same time they are counted. Each bag is sealed with a lead seal with the counters name on each bag.

A complete mechanical department has also been installed. The Philippine Islands can say that they have the most upto-date and complete mint in the Orient, in the way of the latest designed machinery and improved methods of operation.

A great deal of credit is due Mr. Hewitt, the technical mint expert, who built this complete mint equipment under his personal supervision at the mint at Philadelphia, U.S.A, shipped it over there, made the necessary changes to the building, installed the machinery ready for operating, in less than eighteen months from the time he received the official order from the Philippine government. Mr. Hewitt is now supervising the plans for the new Chinese government mint at Shanghai.



ROLLING AND PRESSING MACHINERY, MANILA MINT

Huge Road-Building Program for Japan

ITH only 10,000 automobiles in the empire, the Japanese Diet has appropriated \$125,000,000 or at the rate of \$12,500 per automobile, as state aid during the next ten years for good roads. The comparatively small number of cars in use is 40 per cent. more than were in Japan a year ago, and insistence on good roads has increased in the same proportion. Good highways are needed for many things besides automobile touring, though they are more of an essential for the automobile than for any other conveyance. Of the 72,000 miles of highways on the islands, perfectly satisfactory for pedestrians, small carts, and rickshaws, few outside of the largest cities can be used for motor travelling, writes Junius B. Wood, correspondent of the Chicago Daily News. Two reasons for this are that the narrow, thinly surfaced sand roads are entirely sufficient for the mode of locomotion to which the country was accustomed for generations and that when the excellent system of railroads was laid out, existing highways, grades, and bridges were used for it wherever convenient.

From Tokyo to Kobe is a 378-mile railroad ride of less than 14 hours. The old Eastern Sea Road (Tokkaido) stretches between the two cities. Recently the good roads boosters under the auspices of the Roads Improvement association made a demonstration trip in six automobiles over this road. It required five days. At five different places the railroad is using the only substantial bridges. Pedestrians and carts must either ford or cross on structures which will not hold the weight of a car. It was necessary to load the automobiles on trains to make the crossings. The prefectural government has now set aside \$4,000,000 for the improvement of roads and bridge construction through the Hakone district. Highway bridges are to be built across the mouth of Lake Hamana 18,000 feet long, and over the Fuji-kawa 3,500 feet, the Oi-kawa, 4,200 feet and the Tenryu-gawa about 6,000 feet. It will take several years before the automobile highway through this wonderfully picturesque and historical section is completed.

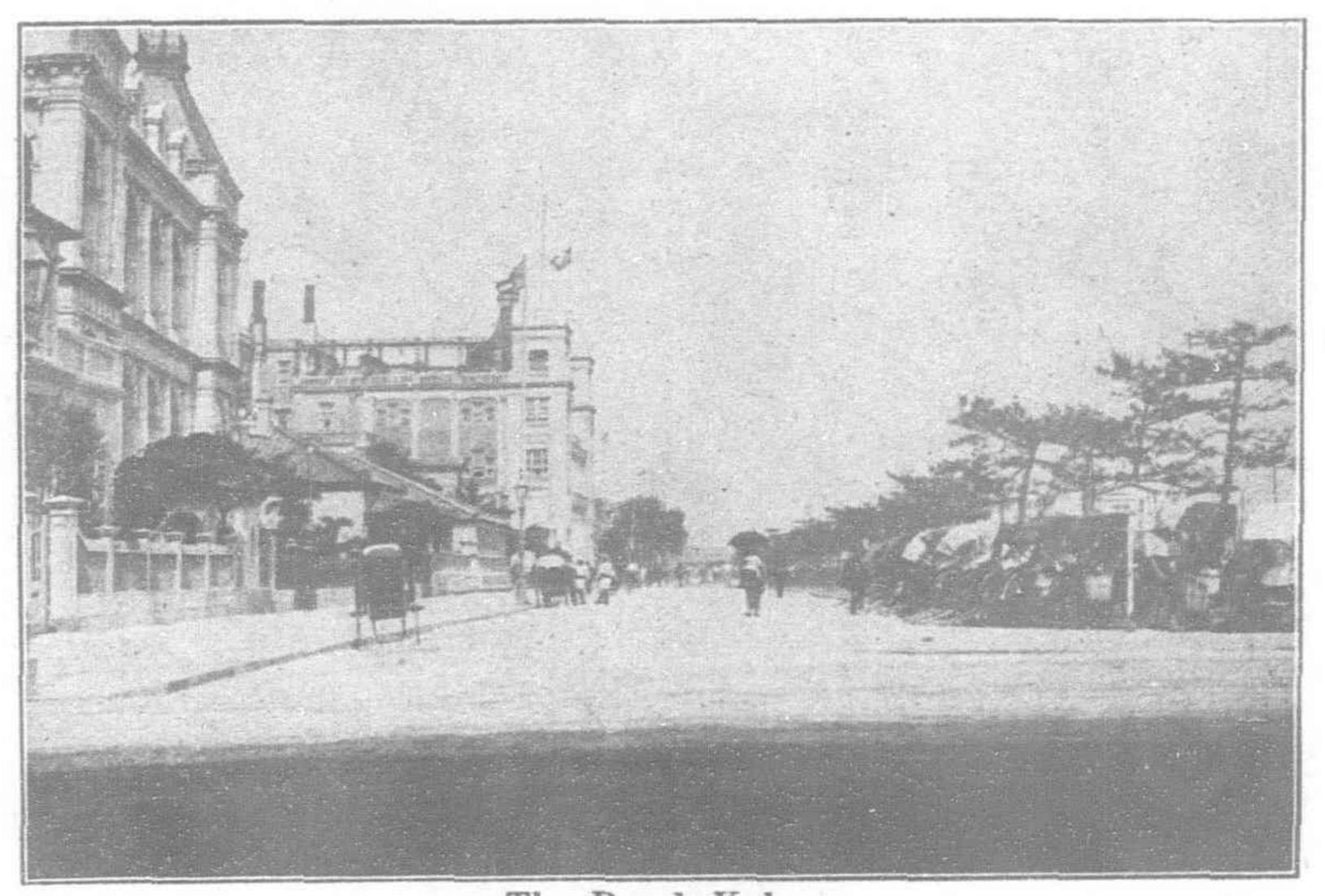
Work is going ahead on several shorter stretches connecting cities. For the 20 miles connecting Kobe and Osaka, \$7,000,000 has been set aside and the work is to be completed in five years. The eighteen miles between Tokyo and Yokohama is to be finished in three years at a cost of \$7,500,000. Next will follow the road between Osaka and Kyoto at a cost of \$2,500,000, connecting with the main Tokkaido Highway. From Tokyo north to Nikko is 97 miles and includes the erection of a 5,600 feet bridge over the Tonegawa at a cost of \$30,000. It should be finished next year and automobiles can then make the run from Yokohama, through Tokyo to Nikko and its temples in three hours.

Military needs have been another strong incentive to good roads. The 21 miles of road between Yokohama and the naval station at Yokosuka, skirting the sea is delightful. This road reaches Kamakura, 14 miles from Yokohama, the old Shogunate capital of the 12th century with its collossal Daibutsu and hoary temples. The state has offered the prefecture \$10,000,000 to improve the other two roads between Yokohama and Kamakura but so far the latter has not come forward with an equal amount.

In Korea and Hokkaido, millions are being expended by the Imperial government for road construction which the local governments must maintain. In four years \$50,000,000 will have been spent for road building in Korea alone. Much of this new highway can already be seen parelling the railroad from Antung on the north for 590 miles to Fusan on the southern tip of the Korean peninsula. In all about 16,000 miles of highway are being built or modernized in Korea.

The construction costs are defrayed by the state paying onehalf and the prefectural, county, municipal and township government paying the other half. An automobile owner pays in the Tokyo district an annual tax of \$59 to the prefecture and \$75 to the municipality and is therefore entitled to some consideration in the way of roads. A bill is before the Diet to have the state collect all the automobile taxes and use them for road building.

Dr. R. Midzuno, administrative superintendent for Korea, is president of the Roads Improvement Association. Some of the others active in the movement are, Takejiro Tokonami, minister of Home Affairs: Baron Y. Shibusawa: Dr. Isozi Ishigura and Kakichi



The Bund, Kobe

Uchida, members of the House of Peers: Baron Renpei Kondo president of the Nippon Yusen Kaisha: Mitsugi Holta, chief of the Government Civil Engineering Board and Dr. T. Kondo, government engineer. Mr. N. Sagami, chief of the roads section of the Home Affairs department, recently started on a tour of America and Europe to study road administration and methods of construction.

Although much of the road construction is being carried out by manual labor, as the work progresses the prospect seems bright for developing a big market for road making and concrete machinery.

Japanese Trust Companies

THERE are over 1,000 trust companies operating in Japan with a total capital of Yen 180,000,000, of which Yen 30,000,000 is paid-up. A large proportion of these concerns are in reality brokers in bills and securities. Only about ten do a real trust business, there being no trust law in force. The following list shows the names of the principal companies operating in Japan:—

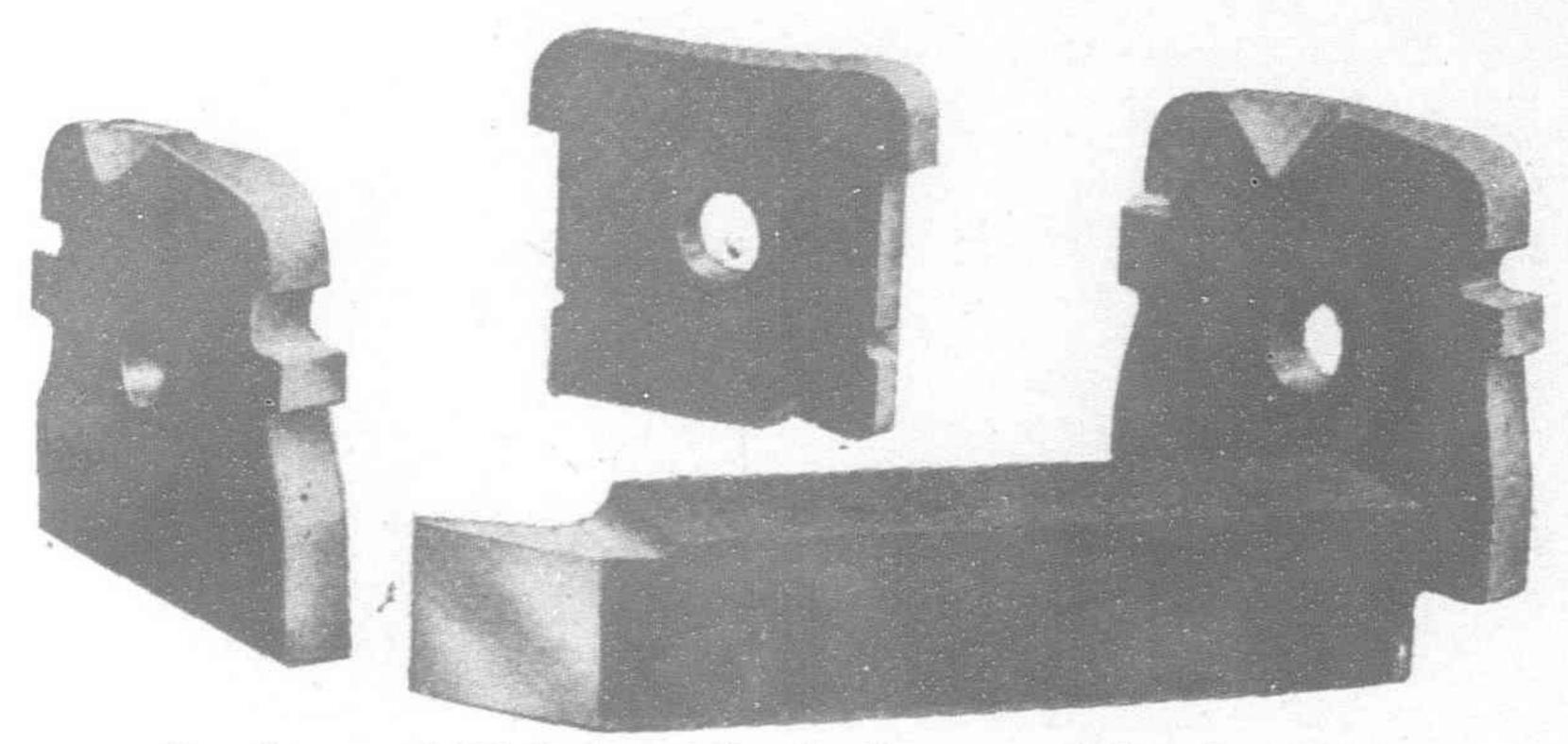
| Name | _ | | | Capital | Paid-up | Location |
|-------------------|---------|-------|------|------------|------------|-----------|
| Japan-American | Trus | t C | om- | | | |
| | | | | 50,000,000 | 12,500,000 | Tokyo |
| Nitto Guaranty | | | | | 500,000 | |
| Nissho Trust | | | | 2,000,000 | 500,000 | |
| Tokyo Trust | | | | 5,000,000 | 2,375,000 | |
| Takasago Trust | | | | 1,000,000 | 250,000 | 22 |
| Imperial Securiti | ies Trī | ıst | | 3,000,000 | 1,500,000 | 2.2 |
| Kobe Trust | | | | 3,000,000 | 1,500,000 | Kobe |
| Kyoto Trust | | | | | 500,000 | Kyoto |
| Commercial an | id Ir | idust | rial | | | |
| Trust | | *** | | 500,000 | 125,000 | Yokohama |
| Aichi Trust | | | | 500,000 | 500,000 | Nagoya |
| Saisei Trust | | | | 2,000,000 | 875,000 | Kobe |
| Domestic and Fo | oreign | Trus | st | 6,000,000 | 2,650,000 | Osaka |
| Nagasaki Indust | rial Ti | rust | *** | 500,000 | 200,000 | Nagasaki |
| Fuji Trust | | | | 1,000,000 | 250,000 | Tokyo |
| Tokyo Industria | l Trus | t | | 5,000,000 | 1,350,000 | 22 |
| Oda Trust | | | | 3,000,000 | 2,400,000 | 22 |
| Yamadaya Trust | | | | 500,000 | 135,000 | Asahigawa |
| Hiroshima Trust | *** | | *** | 2,000,000 | 500,000 | Hiroshima |
| | | | | | | |

Some of the larger of the above companies act as agents for industrial funds and securities and some go so far as to guarantee dividends in new companies. The draft of a new Trust Law now under consideration by a special committee, restricts the minimum capital of trust companies to Yen 1,000,000, of which one-half must be paid-up. The purpose of the law is to eliminate the nominal concerns, and prohibit the others from conducting a banking business. If passed, it will undoubtedly affect some of the larger trust companies in operation.

The Truth About High Speed Steel

By T. Sullers

ERHAPS the real importance to mankind of modern technical materials can only be appreciated by an observer old enough to remember the conditions which obtained when people had to put up with the best that former discoveries could yield. It is not merely the engineer who profits when work is facilitated and speeded up, or the number of spoiled parts and broken tools is the maker's name a more important guide to statisfaction. reduced. The public is the ultimate and the largest beneficiary. Slow work, high labor-cost, and provision for rejections all have to be paid for. Recent events have brought home, even to those least versed in economics, the national importance of big production. Unless we can improve foreign exchange by exporting great quantities of goods at competitive prices, food and clothes will never be any cheaper, and the interest on the war-debt will keep all of us for ever poor. High production and prices low enough to meet foreign competition demand speed in the workshop. It is likely that nothing else contributes in anything like the same degree to this as High Speed Steel.



Specimens of High Speed Spade Cutters and Turning Tools

Thus the interesting booklet* on this subject which has been published is peculiarly opportune at this time. More nearly than anything else which the present writer can recall, it enables one to appreciate, as an older observer of workshop conditions might understand them, the enormous service to tool-making (and thus to the whole public) of the men who perfected High Speed Steel.

Steel and Speed

When the quality of red-hardness had not yet been achieved, work was necessarily slow. A lathe could not be run, or the material fed, above certain rates, or the fractional heat engendered would draw the temper of the tool and make it uesless. The first ingot of what was termed "self-hardening" steel which could be successfully forged was produced by the late R. F. Mushet, in 1868, at Coleford, in the Forest of Dean. It soon passed into vogue wherever men used a lathe. Mr. Mushet's labors, and the calamities by which he was overtaken are extant in his own rather quaint book, now rare. His services to modern steel-practice are unquestionable. The Mushet type of self-hardening steel was not surpassed for 33 years. High Speed Steel of the modern kind had its birth in 1901. It soon revolutionised machine-shop practice and conferred incalculable benefits upon mankind.

Few mistakes are easier to make than that of believing that knowledge of any kind can be useless to mankind. Those who think that men waste time when they potter about in laboratories, mixing various things and looking to see what happens, not only fall into this error, but also misconceive the methods of the industrial chemist.

* High Speed Steel: a handbook giving the History of High Speed Steel, its Heat Treatment, and much other information of value to users. 1920. Edgar Allen & Co. Limited, Sheffield.

It is roughly true to say that all High Speed Steels belong to one of two classes-"special" steel, containing about 18 per cent. of tungsten; and ordinary tungsten steel with about 14 per cent. of this alloy—in either case with small quantities of other elements. But there is a vast difference between the working value of different brands of steel to whatever class they belong. Nowhere

Economy and Prices

High Speed Steels are not cheap. But the economies affected through their tool-making qualities make the price insignificant. A great deal more than the cost of Edgar Allen's "Stag Special" High Speed Steel can be saved by using it for the right purpose. So accurately have the requirements of the tool-maker been worked out, that it can be confidently said that whatever type of High Speed Steel, from the cheapest to the most costly, is properly employed, will save money out of all proportion to its price.

But to secure the full measure of this economy two things are needful. The variety of steel used must be the type designed for the purpose to which it is put: and the steel must come from an authenticated and thoroughly trustworthy service. Neglect of the first consideration means less than the attainable degree of efficiency: and in the conditions of the present day the maximum is none too good. Observance of the second means that uniformity can be relied upon. The steel will never be less good than the sample, and every bar will give exactly the same results as the rest. It follows that the brand on the steel is of first importance. Nothing but loss can result from buying a material of this importance on any other criterion than that of quality. The difference between the lowest price at which what purports to be High Speed Steel can be bought, and the price charged by a manufacturer who knows the importance of reputation, is so insignificant that it would be foolishness to consider it. Moreover, a competent manufacturer can tell his customer exactly what steel to use for every specified purpose, and he will be as sedulous in discouraging the use of a type that is too poor for its work, as in demanding that the best be used where the best will give service commensurate to its price. "Often" says the author of the Edgar Allen book "High Speed Steel," in describing the work proper to be done with the famous "Stag Special" Steel, "often tools made from High Speed Steel of good average quality will break down under the strain of this special work. It is, therefore, perfectly economical in such a case to use the higher-priced Steel. It has a longer life and gives better service." But he is just as emphatic in advising the cheaper grade of Edgar Allen High Speed Steel (Edgar Allen "Air-hardening type") when the job does not require the superior grade. It is mentioned, however, that even this ranks as a "best" steel. The reports of practical users, which form not the least instructive features of this book, are evidence of this fact.

A Work of Reference

For its practical hints on selecting the right grade of Steel for different requirements, and its clear instructions for heat treatment and annealing, this book should be placed in the hands of foremen, besides being filed in the office. In the former place it will save tool troubles. In the latter, through the memorandum, at the end, of the details required to be stated when ordering High Speed Steel, it will obviate much needless correspondence. The thoroughly practical nature of the working instructions given will win the respect of the men whose experience is essential to the good performance of any Steel. A word should be said in commendation of the admirable way in which the book is illustrated. The various forming-tools, milling cutters, drills, bits and the rest look as though you could pick them off the paper: and the illustrations have practical value. They are not inserted merely to look pretty.

FAR EASTERN IRON AND STEEL



General View of the Japan Steel Works at Muroran

THE iron industry in Japan is still depressed. The Toyo Foundry and four others received Y.4,000,000 from the government some time ago and have maintained business. Owing, however, to slack demand and accumulated stock it is said they will be unable to continue unless further financial aid is forthcoming.

The Kenjiho and Penchihu foundries may be able to obtain necessary funds from the Mitsubishi and Okura companies, respectively. The Tokyo Iron Foundry has recently called the second instalment of shares amounting to Y.4,000,000, and the Tanaka Iron Works has also incurred a temporary loan. Many of the smaller establishments, however, find themselves in a financial position which may render them incapable of continuing business.

Measures for relief are being considered in official and private circles, such as an increase of import duty on imported iron, and the establishment of

a selling union.

It is thought the most effective plan of help will be the formation of a combine of different establishments. This proposition is before the economic and financial committee. While it is more practical for the smaller establishments to combine on a solid financial basis, it is thought it will be a difficult task to effect a point of agreement and perfect understanding between different concerns, relative to respective business interests and relations.

Plans to establish a common selling guild among large iron establishments, including the Toyo, Penchihu and Mitsubishi concerns have not reach-

ed a state of maturity, though negotiations are still proceeding.

Y.K. POSTPONES SHIPBUILDING PLAN.—It is reported that the Nippon Yusen Kaisha has decided to suspend the construction of 500,000 tons of new vessels. Of the 500,000 tons shipping provided in the new construction program, fourteen large boats with a combined tonnage of about 100,000 have been already built or purchased. In addition to the above vessels which are already in the service on different lines, the company has issued further orders to the Yokohama dockyards for the construction of seven 7,000 tons cargo-boats including an ice-breaker, to the Mitsubishi dockyards three 10,000 tons cargo-boats, to the Denny dockyards two 6,000 tons passenger boats and eleven other steamers, their combined tonnage reaching about 180,000.

Thirty two more vessels with an aggregate tonnage of about 320,000 tons remain to be built according to the original plan, but in view of the general inactivity of the shipping and shipbuilding business and the tone of the prices of iron and vessels the company has decided to temporarily postpone the execution of the remaining part of the program. It is said the seven ex-German steamers handed over to Japan as trophies of the war, including the Cap Finister, 14,502 tons, Bardenhead, 8,959 tons, and Kleist, 8,959 tons, are to be placed at the disposal of the company upon their arrival in Japan early next year. The six new cargo-boats building at the Yokohama dockyards to the order of the company are expected to be completed by the end of next year, one of them, namely, the Takaoka Maru, to be finished

next December.

Mr. Yen Jen, co-directors of the Pao-hsin Iron Mining Company, of Anhui, have memorialized the Ministry of Agriculture and Commerce regarding their co-operation with the Kailan Mining Administration, of Tientsin, for the establishment of an iron foundry in Chinwangtao. The

proposal is to transport the iron ores of the Pao-hsin Company from Anhui by the steamers of the Kailan Administration to Chinwangtao for the manufacture of steel, while the coal and coke will be supplied by the Tangshan mines and the initial expenses will be provided by British capitalists. The most up-to-date furnaces, under the supervision of British experts, will be imported from England, and the promoters are petitioning the government for exemption from the payment of inland likin and export dufy for a period of ten years, so as to enable the development of the Chinese steel industry through Anglo-Chinese co-operation. The people of Anhui support the scheme.

RON INDUSTRY FOR DUTCH EAST INDIES.—The mining department of the government of Netherlands India has issued a comprehensive report on the possibilities of the development of iron mining and iron and steel manufacture in the island of Celebes. Government engineers have made extensive preliminary studies and surveys of the entire situation, and it appears that either the government or private enterprise will undertake the development of the field in the near future, although the part the government may take in the actual control of the industry has not as yet been fully determined.

The largest ore field to which recent investigations have been directed are those of central Celebes in the Larona district, lying near Towocti Lake. The survey of this field showed 160,000,000 tons of ore, containing an estimated iron content of 5,000,000 tons; and there is believed to be 5,700,000 tons of iron in an additional 210,000,000 tons of ore that have not as yet been completely surveyed and tested. This field holds the best promise for early and profitable development, since it lies within 25 miles of a deep-water bay on the coast and may be very largely worked by electric power, which can be generated from several waterfalls along the Larona River. This river flows from Towoeti Lake to the sea, descending about 300 meters in a distance of 20 miles; about 200 meters of this fall occurs within a length of about 8 miles. In this distance it will be possible to utilize four falls of approximately 45, 25, 30, and 80 meters, respectively, the last-mentioned fall of 80 meters to be attained by the construction of a dam 45 meters high in addition to the natural fall of 35 meters. There is also a possibility of utilizing other falls of about 25 meters above those mentioned, as well as falls below of an additional 50 to 60 meters.

Computing the natural overflow from the Towoeti, Mahalona, and Matano Lakes, together with the average rainfall draining into the river, it is estimated that 2,610,000,000 cubic meters of water are carried annually by the Larona River, or an average volume of 83 cubic meters per second. Having the lakes as natural reservoirs for retaining the heavy rainfall of the rainy season through the dry season, the rate of at least 80 cubic meters per second should be maintained throughout the year. It is then estimated that turbines situated at the four points along the river and utilizing the average flow of 80 cubic meters per second will develop 144,000 horsepower.

Practically the whole ore field lies on or very close to the surface, the purest ore being on the top, so that the working should be possible at a minimum cost. The ore vein over the entire field varies in depth from 4 to 22½ meters, the average depth, calculated from 43 widely separated drillings, being 11.6 meters. The iron content of the ore varies from about 45 to 50 per cent. The average of nine analyses shows the iron content to be 50.55 per cent., while the manganese content is 1.19 per cent. and nickel 0.38 per cent. Rather incomplete analyses as to the sulphur content indicates about 0.14 per cent.

Bridge & Bolt Company.—The Bengal Bridge and Bolt Company, Limited, propose to increase their capital to Rs. 50,000,000 by the creation of 250,000 new shares. In their report for the half-year ended June 30th the directors mention that the bolt and river plant, since removal from Ramkristopur to Shalimar, is producing 120 tons per month of highly profitable work, and with new machinery which has now actually arrived, and in course of installation an outturn of 250 tons per month will soon be attained. During the half-year the company's profit was Rs. 2,90,233.

COAL AND IRON IN THE PHILIPPINES.—The report of the Philippine Bureau of Science says that very little of the iron produced in 1919 was made into pig iron in this country. Most of it, 18,598 metric tons valued at P.92,990, was exported to Japan in the form of ore. Only 67 metric tons were made into pig iron in the Philippines, and this was in the Angat district, where the industry is entirely in the hands of Filipinos. Practically all of this iron goes into the making of plowshares. The iron mined and exported by the Japanese came from Calambayanga Island in the Paracale district. Undoubtedly market conditions at the close of the war made further exportation of this iron ore impossible and the industry ceased early in the year. The export tax of P.2 per ton is a serious hindrance to the development of the iron industry.

In regard to coal, the report says it is extremely gratifying to see the industry at last coming into its own in the Philippines. The largest producer of coal is the Philippine Coal Mining Company on the eastern end of Batan Island. This company is producing over 300 tons of coal a day, and the

officials of that concern are to be congratulated upon their output.

PROP FORGINGS.—J. H. Williams & Co., makers of Superior Drop Forgings and Drop-Forged Tools, with works at Brooklyn and Buffalo, N.Y., U.S.A., have just issued a catalogue—4×6—160 pages—fully illustrating and describing their standard stock specialties. These include several new lines of goods, viz: "Agrippa" Turning-Tool Holders, Set Serew Pattern, "Agrippa" Boring Tool Posts, "Vulcan" Forged Cutter Tool Holders, and several new assortments or sets of Drop-Forged Wrenches.

The book contains, also, a description of the drop-forging process in very simple, non-technical style for the benefit of those not conversant with

its details.

of this company have issued their report and profit and loss accounts for the year ending 31st March, 1920, which show that the company's net profit during the year amounted to Rs. 11,531,363 which, with the sum brought forward from the last year's account, makes a total sum of Rs. 11,6-30,176. From this the directors have carried to depreciation fund account Rs. 5,500,000, while a sum of Rs. 1,109,375 has been distributed as ad interim dividend for six months ending 30th September, 1919, and they now recommend a final dividend of 6 per cent. per annum on first preference shares, a final dividend of Rs. 9 per share to the ordinary shareholders, and a dividend of Rs. 60-13-4 per share to the deferred shareholders, carrying forward Rs. 264,551.

The scheme of extensions is being vigorously pushed on, and a considerable amount of machinery has been received. The third blast furnace, known as the batelle furnace, was completed during the year and put into operation. The 300 drag ovens constructed temporarily to provide coke for this furnace are in full operation. The seventh open hearth furnace was brought into operation recently. The plate mill is being completed and will, it is expected,

be in operation by the beginning of next year.

The progress in mining and prospecting departments has been satisfactory. Mine No. 2 at Gurumaishini has been opened and the increased requirements of the plant have been met in full. The town department has been re-organized by the appointment of Mr. S. K. Sawday, late of the Indian Civil Service, as town administrator, and Mr. F. C. Temple, M.I.C.E., M.I.M.E., M.R.S.I., late sanitary engineer to the government of Bihar and Orissa, as chief town engineer. Additional bungalows and buildings with drains and roads have been constructed during the year.

A detailed scheme has been completed for supplying water for the present town and future extensions, sufficient water being provided to meet the needs of 150,000 people. The welfare department is being re-organized under Mr. Brokenshire who has been specially brought out from England for this work.

BENGAL IRON COMPANY.—Arrangements for a largely increased output by the Bengal Iron Company have made good progress. An additional furnace is to be installed shortly, and by the end of the year the company's pig-iron production alone will be increased by over 25 per cent.

The Bengal Iron Company, capitalized at £2,500,000, is a reconstruction of the Bengal Iron and Steel Company, which was formed in 1889 to acquire from the Indian government a 999 years' lease of ironworks and coal mining properties of about 1,500 acres in Bengal.

During the past few years the record of the company has been one of continued progress. This is indicated by the following figures:—

| | Profit | Dividend |
|------|----------|----------|
| 1913 | £54,754 | 12% |
| 1914 | £58,559 | 120/ |
| 1915 | £121,522 | 24% |
| 1916 | £149,380 | 24% |
| 1917 | £136,874 | 30% |
| 1918 | £280,823 | 32% |

In 1910 the company acquired large deposits of high grade ore, the working of which has, no doubt, in a large measure contributed to the increased profits.

Apart from the natural growth of the Bengal Tron Company, it is favored by the general conditions which have arisen in India as a result of the war.

PEKING BLAST FURNACE.—The Lunguen Mining Administration is preparing a site for the new blast furnace at a point called Sanchiatien on the Mentoukou Branch of the Peking-Suiyuan Line, about ten miles from Peking. Orders have been placed for the necessary material and equipment. Iron ore will be supplied from the Lunguen mines near Hsuan-huahsien. Limestone will come from the new quarry which is being opened near Changchungshan, and a branch line of railway is being laid from the quarry to the Peking-Mentoukou line, so that this material can be transported directly to the furnace stock bins. Coal and coke will be secured for the present from subsidiary mines along the Peking-Hankow Line. Messrs. Perin and Marshal, 2 Rector Street, New York City, N.Y., are the consulting engineers.

Must Have Foreign Steel Markets

(Special Correspondence of "The Far Eastern Review")

New York, November 2.—To manufacture steel at her maximum capacity, the United States must have foreign markets, Mr. A. H. Holliday, manager of exports of the Jones & Laughlin Steel Co. told the American Iron and Steel Institute. "The per capita consumption of China and Japan for 1918," said Mr. Holliday; "based on the conservative estimate of 383, 000,000 combined population was 6.5-lbs. of finished steel compared with the United States per capita of 517-lbs. for 1913 based on 98,000,000 population." Mr. Holliday singled out China as one of the undeveloped fields that can assist to assimilate increased world's production of steel.

First Chinese Manganese Reaches New York

(Special Correspondence of "The Far Eastern Review")

New York, November 16.—The first shipment of Chinese manganese reached New York on the steamer *Grace Dollar*, viâ the Panama Canal. The consignment was 2,000 tons.

First Chinese Iron Ore Landed at Baltimore

(Special Correspondence of "The Far Eastern Review")

Baltimore, Md., November 3.—At the Canton ore pier here 2,540 tons of iron ore from China are now being unloaded from the Green Star Line steamer Canibas. Although ships have been sailing between this port and China since the clipper days and the pioneer China trader, Empress of China, this is the first time that Chinese iron has been an item of cargo. The Baltimore Sun says: "The shipment probably means that a new market has been created for Chinese ore and that in the near future large quantities will be brought here for distribution."

"Grand St. to Move to Shanghai"

(Special Correspondence of "The Far Eastern Review")

New York, November 3.—The sweat shops of the Grand St. region will move in a body to Shanghai, ready-to-wear men say, if the Dyer bill gets through Congress. New York City Women's Wear prints dispatches from its Shanghai correspondent showing that high hopes are entertained of huge profits to be made out of cheap Chinese labor, against which even the underpaid workers of the Lower East Side could not compete. For several years past, despite lockouts that caused riots, bloodshed and starvation, trade union organization has been making headway. In the meantime, attention of the master garment-makers was drawn to the possibilities of Shanghai as a world's centre of cheap ready-made production. Says the Shanghai correspondent of Women's Wear:—

"Fear of legislation influenced by American labor organizations is the chief obstacle blocking any plans of large apparel manufacturers in the United States looking to the establishment of factories here for the making of ready-made garments with cheap and efficient native workers, trained and supervised by American foremen. Inquiries have been made by a few large organizations in the States and in two instances plans were tentatively completed, only to be abandoned because of the uncertainty of the possible action of the labor unions at home, whose campaign against the making of garments for American consumption by the Chinese might inspire legislation similar to that enacted by Australia, which, in effect, would wipe out the capital necessary to put the plans into successful operation."

Engineering, Financial, Industrial and Commercial News

RAILWAYS, NEW LINES, SUPPLIES, ETC.

Baldwin Locos for China. Ten Baldwin locomotives have been shipped for the Peking-Suiyuan Railway, China, also ten Baldwin locomotives to Peking-Mukden Railway, China. Twelve Baldwin locomotives for the Canton-Hankow Line, Hunan-Hupei Section, have recently arrived at Hankow.

Enlargement of Railroad Station, Osaka, Japan.— The Umeda main railroad station of Osaka will be enlarged in the near future. A large locomotive round house is already under construction.

Bridge Construction Car. Japan.—The Hamatsu Works of the Imperial Government Railways, has recently built a bridge construction car, with a length of 70 feet, 7 feet in width, with 16 wheels bogie trucks.

Saiki-Kanbara Railway, Japan.—The construction of the government railway between Saiki and Kanbara, Kyushu, a distance of 9.8 miles, has just been completed, and the railway is open for business. The chief products of the districts are-railroad ties and general lumber.

Lhasa-Indian Line Project .- The visit of Mr. C. A. Bell, political officer, to the Dalai Lama has revived hopes of the construction of a railway line from Lhasa to India, along the banks of the Amuchu and Tursa rivers.

Railway Sleeper Tests, Japan.—The Japanese Railway Department has been testing timber, iron, and concrete sleepers, since 1913, and finds that the (larch?) sleeper is good for six or seven years. This has determined the department to go into the forestry business on its own account. The tests of steel and concrete ties are still going on. It is estimated that the government railways of Japan use about 3.500,000 sleepers annually, at a cost of Yen 4,550,000.

Rolling Stock Bonds .- Chinese bankers suggest that the ministry of communications issue bonds to the amount of \$6,000,000 silver, for purchasing cars to make up the present shortage on different lines. The Banks of China and Communications recognize this as an industrial loan, but claim the right of supervision over the expenditure. loan is now under negotiation.

New Private Railway, Japan.-The Nota Tramway Company, Ltd., of which Mr. Tsuda Chusuke is chairman, has received permission to construct and operate a tramway line 61 miles in length, connecting Hagui-machi with Wajima-machi in Ishikawa Prefecture. Its cost is estimated at Yen 6,500,000.

Kobe-Osaka Four Track Line .- Part of the line between Nada and Ashiya has been completed at a cost of Yen 1,500,000. Work is being pushed ahead on the balance of the line, estimated to cost Yen 6,500,000.

West Korean Railway Company, Ltd.-The line between Sarien and Sainei, 14 miles in length, was

main S.M.R. Line. A locomotive and car house traffic at f.75,000; and from other sources at about will be erected at Sainei.

Actual Earthwork Costs in China.-The Han Railway Administration proposes to construct the west section of Chang-Si line from Si-Chia-Chuan to Wu-Chiang-Hsien, a length of about 200 li, in order to provide employment to the famine sufferers. The usual contracting methods are to be abolished doing away with the profit paid to contractors and earth work done by the laborers will be paid for as follows :-

Cents per 100 cu. ft. Height of embankment. Under 5 ft. (Chinese measure)...c18 silver .09 gold Between 5 and 10 ft ...c20 ,, .10 ,, ... Above 10 ft.

The Hukwang Rallway.—In order to utilize the famine labor in North China, the director of the Szechuan-Canton-Hankow Railway has decided to renew the work of building certain sections of the line by employing the famine sufferers. At a railway conference held in Peking some time ago, a resolution was passed authorizing the authorities of the Szechuan-Canton-Hankow Line to raise a loan for the work and, accordingly negotiations were entered into with certain American syndicates for finitely settled between the American financiers templated :and the authorities of the Szechuan-Canton-Hankow Line (?) The contract for the loan is to be signed after Mr. Yen, the director of the Szechuan-Canton-Hankow Railway, arrives in America to make further arrangements with the American financiers interested in the deal.-Chinese Press Report.

Railways in the Celebes.—On July 19 the first ground was broken for the Takalar-Macassar-Maros railway, destined to extend through such districts as are rising economically or are likely to prosper in the future.

peng to Singkang a distance of 150 K. M.; and of the Tientsin-Pukow Railway. the costs are estimated at 10 million guilders approximately.

Meanwhile, although the State Railway Service is dreaming of laying down railways all over the south-west, the Takalar-Macassar-Maros line is the only one that will be constructed at present. The length of the line will be about 72 K. M., the costs being estimated at a round 3 million guilders. The line passes through fertile and densely populatinstance.

balance.

The proceeds from the passenger traffic are es- and I-Kwei Sections, Szechuan-Hankow Railway,

completed in December, it will connect with the timated at a round f.180,000; from the goods f.16,000. The managing expenses will amount to about f.130,000 a year, leaving a favorable balance of f.1,000,000 yearly.

> German Railway Material for Java!-Respecting the order of the Netherlands government for thirty-seven railway engines for Java from Krupps, which was contradicted in the Dutch papers, the Netherland Indies Review is informed by an irrefutable authority that Krupps have actually received this order, and that their tender which was approximately fl. 12,000,000, was lower than those of British and American competitors, which were in the neighborhood of fl. 20,000,000. Furthermore, the Essen firm is straining every endeavor to ensure that they shall not be "entrusted with the supply of engines" alone, but, that orders for wagons, rails and other equipment required for railway expansion in the Netherlands East Indies shall be passed to them in due course.

> Ching-Meng Railway.-The Sinwanpao reports that the Ching Meng branch line of the Taoching Railway in Honan is now being surveyed and the land needed is being bought up.

the loan. It is understood that everything con- New Construction, Manchuria.-The construction cerning the stipulation of the loan has been de- of the following railways in Manchuria is con-

Miles.

| | | | -12 | | |
|---------------------|--------|--------|------|------|-----|
| Kirin-Hweining Line | | *** | *** | | 160 |
| Kirin-Kaiyuan viâ H | ailung | cheng | | *** | 170 |
| Szupingkai-Tapnanfu | | | *** | *** | 100 |
| Chinchow-Aigun Line | | | | | 700 |
| Changchun-Taonanfu | Line | 0.00 | *** | | 150 |
| Taonanfu-Jehol Line | | | | *** | 370 |
| From a point on the | Taon | anfu-J | ehol | Line | |
| | | | | | 150 |
| | | | | | |

Grading (?).—The ministry Chefoo-Weihsien of communications states that grading of the Yen-Wei Line from Chefoo to Wei-Hsien, a distance The extended line will run from Maros by way of about 200 miles, is now in progress, under the of Pangkadjene-Segiri-Tanette, Mariori and Sop- direction of Mr. Chao, former district engineer

> Tsang-Shih Line.—The construction of the Tsang-Shih Line from Shih-Kia-Chong to Tsang-Chow, has been started and grading is now in progress. This line is approximately 210 kilometers in length and will be constructed jointly by the Peking-Hankow and the Tientsin-Pukow Railways.

ed plains of Goa and Maros, that hold respectively Canton-Hankow Survey .- On account of the 160,000 and 70,000 inhabitants, not counting the unsettled political conditions in the Province of people living beyond the ricefield area. The Goa Hunan and also by reason of insufficient funds, plain covers about 45,000 bahoes, the Maros plain the survey of the Canton-Hankow Railway from about 12,000 bahoes. They yield a considerable Chuchow to the Kwangtung Boundary has been quantity of good rice of which, a monthly average suspended for some time past, but by order of the of 400 piculs is shipped at Macassar, the want of minister of communications and the directorthe population having been supplied in the first general of the Han-Yueh-Chuen Railways, negotiations have recently been undertaken with a view The estimate of the profits and expenses of the to resuming the surveys of this line. Arrangements Takalar-Macassar-Maros line shows a favorable have been made for Mr C. J. Carroll in addition to his duties as engineer-in-chief of the Han-I

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to take charge of the survey party which will very shortly resume the survey of this line.

TRAMWAYS

Peking Tramways .- As a preliminary step towards the building of tramways in the Chinese capital, the Peking Municipal Bureau has appointed a party of experts to survey the principal streets in the city, beginning with the sections of the street at Tungshihpailou and Hsishihpailou, where the authorities plan to build two main lines.

Canton Tramways .- Work is to begin soon on the construction of the Canton Tramway. The \$3,500,000 capital desired has been almost fully subscribed and some \$600,000 worth of materials for the proposed street railway are said to have been ordered.

Electric Tramway, Kyoto.—The Kansai Electric Tramway Company, Ltd. was organized recently with a capital of Yen 10,000,000 for the operation of tram cars between Kyoto and Nara. The application has been presented to Kyoto prefectural office.

yama Electric Tramway Company, Ltd. has been bodies. granted permission to construct and operate a line between Yumino-machi and Taiunji-machi in Okayama city.

Electric Tramway, Tokyo.-The Todai Electric Tramway Company, Ltd., was organized recently by Mr. Torahiko and others, with a capital of Yen 8,500,000, to operate an electric line from Kanda-ku in Tokyo to Omiya-machi in Saitama prefecture, current to be supplied from a steam power plant. Permission, it is reported, will be granted subject to certain conditions, among which is one to connect with and form part of the new underground system, and when permission is granted, that work must commence within three years.

Okazaki Electric Tramway Company recently applied for permission to extend its line from cation is granted.

Keihin Tramway Extension, Japan.—The Keihin Electric Tramway Company has applied for peras sites for factories.

ELECTRIC LIGHTING, POWER, ETC.

German Dynamos for Nantungchow, China's "Model City."-Notwithstanding his recent visit to the United States and many after-dinner orations on Chinese-American business co-operation, Mr. Chang Chien has decided to order German dynamos and a complete German light and power plant for China's "model city," Nantungchow. After a conference with his elder brother, Mr. T. A. Chang, Mr. Chang Chien has placed a German engineer in charge of the electrification plans. Bonds are to be issued locally to cover the cost of installation and preliminary operation. The German machinery is expected to arrive in May. This announcement comes in curious confirmation of pre-

ERN REVIEW. Antagonism to Japan does not deli- guilders. ver the American electrical business either in China or in Japan. In business, it always pays to keep out of politics.

China and Electrical Material.—Although there are considerable opportunities for British electrical firms to secure business in China, new electric plant being installed in many of the larger cities, caution (says a correspondent in The Times Trade Supplement) should be observed. This is emphasized by the fact that in connection with an electric light plant recently installed by a Japanese firm in a certain city in the Republic, so many natives have installed small petrol or oil-driven units and are selling light to those of their neighbors who can be included on the circuits, that the financial success of this municipal plant is doubtful. Chinese laws provide that all agreements or contracts entered into with regard to mines, railways, or other public property made between provincial authorities or private Chinese persons are invalid unless they have previously received the sanction of the Chinese government in Peking. So many serious misunderstandings have recently arisen on this subject that British firms interested in electrical or other undertakings should familiarise themselves with all conditions before they enter Electric Tramway Extension, Japan.-The Oka- into any definite contract with municipal or other

> Teikoku Electric Light Company, Ltd.—At its annual meeting held in Tokyo on November 3 this company voted to amalgamate with the Gaibo Electric Company, Ltd. (capital Yen 300,000) and the Toyok Kuni Electric Company, Ltd. (capital Yen 500,000). The plan is to reorganize with a capital of Yen 18,725,800, in which the Teikoku will hold 368,000 shares (par value 50, and 45 paid up) the Gaibo will hold 4,016 shares (par value 50, all paid up) and the Toyokuni 2,500 shares (50, all paid up.)

> the Akano river, which will increase its power rights another 50,000 horse-power.

Want More Electric Light .- The Chapei (Shang-Asuke, in Nagoya prefecture, to Sida in Nagano hai) Chinese tax-payers have petitioned for extenprefecture. The line passes through heavy country, sion of the electric light works, which are under and the estimated cost per mile is Y.100,000. The the provincial control and have long been unable company will increase its capital when their applito to supply sufficient current. The Sin Wan Pao says a reserve fund amounting to several tens of thousands of dollars has been built up. Why this money is not used in effecting the much needed improvement or extension, which would be both a mission to extend its line from Tsurumi along the legitimate and profitable investment, is a mystery shore for a distance of five miles. This will assist to all outsiders. A joint petition submitted by the in developing the shore lands now being reclaimed public bodies of Chapei to the governor at Nanking, asking for authority to use this reserve fund, has brought forth no response. Mr. Tsiang, manager of these works, is said to have tendered his resignation, as his suggestion for improvement was ignored by the governor.

> Japan to Adopt New Wire Standard .- According to recent advices from Japan, ten of the principal electric wire manufacturers have issued a joint statement advising that they have completed preparations for the production of insulated electric wires and cords to meet the official standards published in October last. The manufacture of the old-type wires and cords which have until this time been used in Japan will be discontinued, it is stated.

Electrical Machinery Needed .- The Bukit Asam government colliery in Java badly needs an elec-

dictions made by the publisher of The Far East- bought in 1921 at a cost of about two million

Electrical Supply for Pootung.—The Pootung Electric Supply Co. has finished testing its plant and has commenced the supply of current for lighting. The capacity is 300 k.w., which will be doubled as soon as the duplicate set arrives in Shanghai next month. The plant has been erected under the guidance of Mr. S. H. Dong, general manager and engineer-in-chief.

Loans to Electrical Enterprises, Korea. -The Bank of Chosen recently advanced Yen 40,000 to the Taikyu, Taiden, Gensen and Kaishu electric light and power companies, to enable them to carry out their extensions.

Gobishi Electric Machine Co., Ltd.-Organized with capital of Yen 1,000,000, quarter paid-up, for the manufacture of electric machinery. Office: 24 Minami-Konya-cho, Kyobashi-ku, Tokyo. Managing Director, K. Hirayama.

The Gumma Electric Company, Ltd.-This concern has about half completed the power plant and tunnel under erection at Kanaimura, Gumma prefecture. The transmission lines are now being erected.

Large Municipal Electric Power Scheme, Japan. The Hyogo Prefectural Assembly has before its consideration a scheme to construct several hydroelectric plants to be operated under the management of the prefectural authorities and financed by prefectural loans, aggregating Yen 3,600,000. The scheme provides for the construction of nine power plants using the waters of the Sho and Chigusa rivers. The location and capacity of these plants are as follows; Fukuchi plant, 366 Kilowatts; Nishifuka plant, 464 kw.; Roga plant, 531 kw.; Himidani plant, 582 kw.; Ariga plant, 372 kw.; Nojiri plant, 615 kw.: Chiguya plant, 566 kw.; Kawasaki plant, 603 kw.; Usushino plant, 406 kw.; total, 4,505 kw. Construction is expected to com-Katsuragawa Hydro Electric Company, Ltd.- mence in 1921. The plan provides for the com-Has received permission for the development of pletion of three plants every two years until 1926.

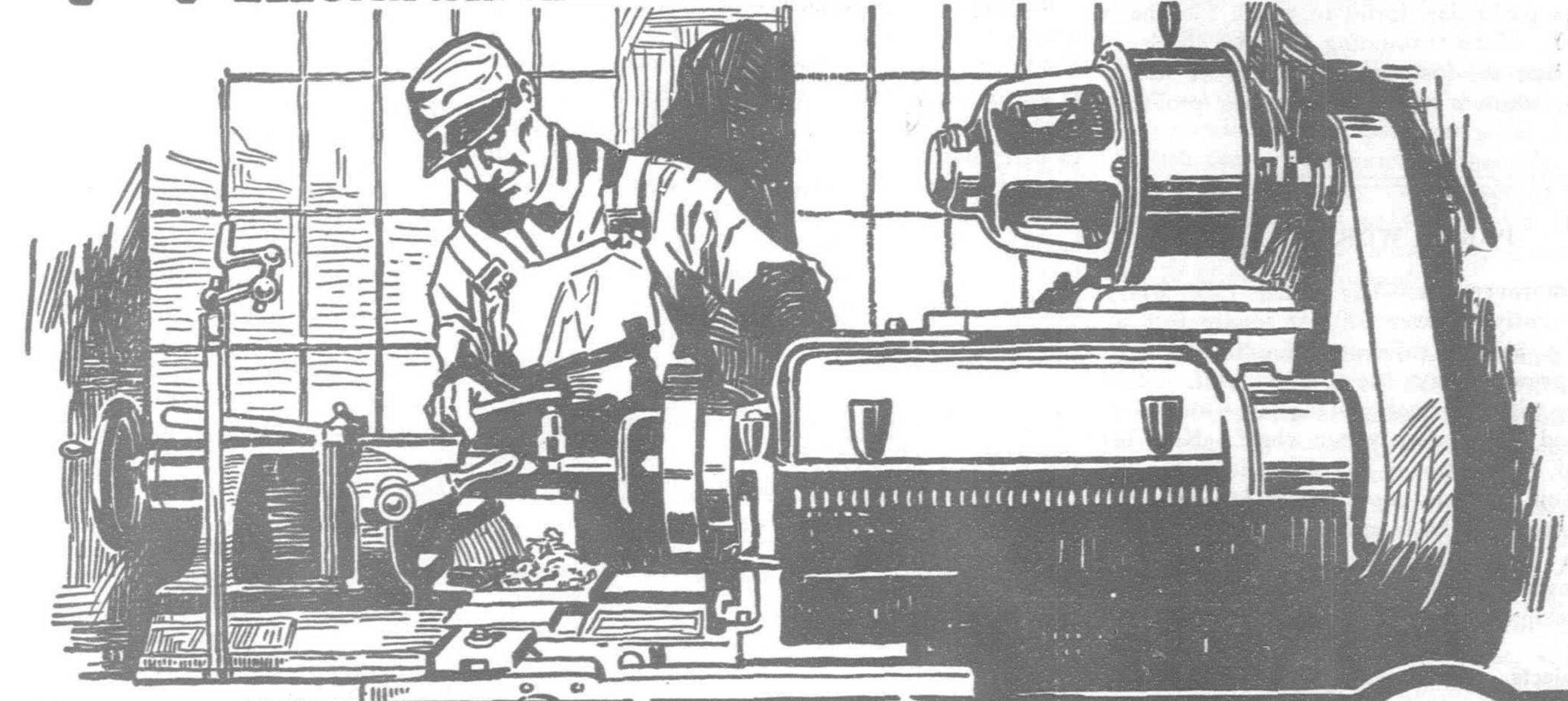
TELEPHONES, TELEGRAPHS, CABLES, WIRELESS

New Central Telephone Station, Tokyo.—The department of communications has decided to construct the new Tokyo central exchange in Marunouchi, at a cost of Yen 3,600,000. The new building will cover 4,000 tsubo. It will be five stories in height and built of steel and concrete. It will be completed by 1924.

Powerful Wireless Station, Japan .- Plans for a Y.200,000 wireless receiving station to be located in the Kwansai district of Japan have been submitted to the Diet. The station will be among the most powerful receiving stations in the world.

Wireless Telegraphy, China .- Nearly two years ago the Chinese government entered into a contract with the Marconi Wireless Telegraph Co., of London, for the erection of three powerful wireless stations, which would constitute the longest stretch in the world of wireless communication. The original plan provided for stations at Lanchowfu, Urumchi and Kashgar, but this has been changed owing to the different conditions brought about by the cancellation of independence by Mongolia and the return of the former dependency to the fold of Peking. Urga has been selected as the location of the first station in preference to Lanchowfu, and the work there has already commenced, tric central and other machinery. These will be the apparatus and material having been stored in





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race. What tremendous advances the last century has disclosed!

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less telephone field sets for military purposes. estimated cost of Yen 393,000. These were purchased from the same company. For some months past instruction in the use of these sets has been proceeding at Peiyuan, near the Yellow Temple, Peking. The men are inclined to indulge their own preferences rather than to carry out the particular duties to which they have been detailed. Notwithstanding this drawback, it is apparent that the instruments will prove useful in Mongolia, whither most of them are probably to be sent.

PUBLIC WORKS

Kowloon Improvements.—The Kailan Coal Mines purchased recently of over 500,000 square feet at Laichikok for \$51,415 calls attention to the way Kowloon is growing, says the China Mail. The coal company will presumably stack large stocks of coal there, and have a deep water wharf. Near by the Standard Oil Company is reclaiming for a large extension of their depot. Not far away a wolfram smelting works is starting, and all round the Kowloon coast, from Cheungshawan right round to Kowloon Bay to the eastward, reclamation and development may be observed.

Macao Projects .- A solution is being found for the problem of the water supply. The public works department has some portion of the work now in hand and a contract has been let to Messrs. Turner & Co., of Tientsin, for other portions of the undertaking. A contract had also been let for putting the telephone wires underground; town drainage work was in progress; and an up-to-date equipment was coming for the fire-brigade. The great harbor scheme is the most striking improvement, and its completion will add many hundreds of acres to the area of the Colony.

Tokyo Public Works, 1921.—The total estimate for the city of Tokyo for 1921 is about Yen 30,000,-000, of which Yen 2,200,000 is designated for the following new works: Two middle schools, normal and girls' school extensions; Tamagawa and Yedo river water works; Settlement work; Labor Hall; Water supply investigations; several parks outside city limits.

Public Works, Shidzuoka Prefecture, Japan.--The most important public works of Shizuoka prefecture for 1921 will be-Brigade construction, Yen 58,704; road construction, Yen 42,811; road improvement, Yen 500,000; river bank constructions, Yen 45,000; school constructions and educational expenses, Yen 74,451; purchase of agricultural machines, Yen 5,761; purchase of motors by the industrial office, Yen 1,622; appropriation for forestry, Yen 13,504.

Osaka Estimates.—The public works estimates of Osaka prefectures for 1921 embrace reconstruction of Syutoku Kan, to cost Yen 330,000; construction of wireless telegraph station at observatory, estimated cost Yen 2,105; construction of a higher girls' school, Yen 580,000; reconstruction of three girls' schools, Yen 25,000.

Yokohama Improvements.—The public works estimates of Yokohama and Kanagawa prefecture for 1921, include: Construction of No. 3 fire brigade station to cost about Yen 58,000; purchase of a motor-boat (5 tons) for water police, estimated cost Yen 13,000; establishment of a middle class school at an estimated cost of Yen 304,000; construction and enlargement of Yisaki harbor at an estimated cost of Yen 700,000, half of this sum will be borne by the national treasury; road

PORT WORKS, HARBORS AND DOCKS

Woosung Improvement .- Mr. Chang Chien's committee has drawn up plans for the proposed Woosung port development. The ministry of finance is asked to grant approximately a thousand acres of land to the Woosung Improvement Bureau and then to carry out the following steps after obtaining the consent of the Whangpoo Conservancy Board :-(1) Open Woosung as a commercial port; (2) Build a harbor and dockyards; (3) Build main roads for tramways; (4) Establish a stock company with a limited liability for the promotion of various industrial enterprises, with a capital of ten million yuan to be divided into 400,000 shares of \$25 each.

Port of Pukow .- Mons. Francois has been engaged as the engineer to build the port of Pukow and an agreement was signed, December 10, at Peking.

New Dockyard, Tarui, Japan.-The government has recently granted permission for the construction of a large dockyard in Tarui, Osaka prefecture, and for the reclamation works of the Izumi Dockyard Company, Ltd. The reclamation works will be commenced within six months from the date the permission was granted.

Taki Harbor Works, Japan .- The reconstruction of this harbor in Ishikawa prefecture was commenced on November 23.

Harbor Works Estimates, Japan .- The home department of Japan has included in the estimates for 1921 an estimate of Yen 35,500,000, for the improvements of Yokohama, Shimuzu and Shimonoseki harbors, and the reconstruction of the Kisc and Hii river protecting works.

Harbor Project .- Plans have been prepared by the Samarang Harbor Board for a new harbor. The scheme proposed is to construct an open harbor with long breakwaters, which will enable vessels drawing up to about 30 feet to enter and discharge their cargoes into lighters in calm water, and the estimated cost of the work is £1,000,000.

Nagasaki Harbor Improvements .- The necessary funds have been voted for the improvements to Nagasaki Harbor, which are designed to:

To fill in the foreshore at Deshima for a length of 230 ken (1,372-ft.), and an average breadth of 26 ken (147-ft.), and to build a quay wall 14-ft. above low tide at which two steamers of 8,000 tons, or three of 5,000 tons, can moor. At a later date the railway line (now nearly a mile distant) is to be connected, and warehouses are to be built on the reclaimed ground.

To dredge to a depth of 30 feet in front and in the neighborhood an area of 100,000 tsubo (about 400,000 square yards), thus adding a third to the available area of this depth in the inner harbor.

To built a landing stage by the station, to enable goods to be loaded direct from the railway trucks to lighters.

These works are estimated to cost one-and-a-half million yen. Of this the government is to pay one-half, the other half will fall upon the city. The exact manner in which the sum is to be raised has not yet been decided. The work is to occupy three years.

Harbor Improvements, at Auckland, N.Z.—Plans are well under way for the completion of wharves steel bridge over the Fuji River, 170-ft. in length

a temple in the Mongolian capital for several construction over Hakone mountain to Mishima and sheds at Auckland as well as the construction months. An adjunct of this wireless service has town, to cost Yen 170,000; construction of an iron of three more wharves in order to meet the debeen provided by the delivery of 200 portable wire- and concrete bridge over the Banyu River at an mands of the constantly increasing commerce of that city. Frequently the wharves are so badly congested that shipping must wait its turn. The Auckland Harbor Board has been authorized to place a loan of \$4,866,500 for the developments indicated above, and the chairman of the board has announced that work will be pushed as rapidly as possible.

> Dairen Harbor Works.-The following statement by an official of the South Manchuria Railway Co. Harbor Works Office, Dairen, tells how the Dairen harbor works are progressing :-

> As to dredging operations, the fairway just outside the Basin, that is, for a distance of 400 ft. from the entrance to the Basin with the breadth of 600 ft. is being dredged to the depth of 32 ft. This piece of work is expected to be completed by the advent of winter, to be resumed next fiscal year.

> The extension work of Wharf 2 (Main Wharf) is planned to be finished by the end of 1922, and, for the current season, 430 ft. of the northern extremity on the eastern side of the Wharf will be completed. On the completion of the work, the depth of value will be made more than 37-ft., quite capable of berthing shiips of over 20,000 tons.

> Up to this year, some Y.1,000,000 has been laid out annually in construction works. The sum to be appropriated for 1921 and 1922 will be Y.1,500,000 or so. Most part of the work has to be done in the water, to add to its difficulty.

> As to reciamation work, 40,000 tsubo has been reclaimed at Jijiko, 220,000 tsubo in the east of the Dairen River 2 at Hsiaokangtzu (Chinese Quarter of Dairen) and some 80 per cent. of a water area in Kodama-cho, Dairen, 900 ft. long and 300 ft. wide. The new reclaimed tracts at Jijiko and Hsiaokangtzu may be used as storage ground for Dairen Wharf goods, and that in Kodama-cho as a place of loading and unloading junk goods exclusively. The reclamation work in Kodama-cho is to be continued into the next fiscal year to the extent of about 130,000, tsubo. The question before the S.M.R. Co. management is the proposed construction of Wharf 4, on the completion of which exports and imports to the amount of over 2,000,000 tens may be handled, and in such event, an open storage yard of more than 100,000 tsubo capable of storing over 150,000 tons will be necessary. As matters stand, there is no further room for extension, and, in order to construct Wharf 4, the local Kawasaki Dock must be removed elsewhere. This removal, if accomplished, will make about 100,000 tsubo available for additional storage ground. The authorities directly concerned are at a loss where to find the new site for the Dock.

BRIDGES

New Bridge, Tokyo .- It is planned to build a stone bridge over the Nishimbashi road to the central station, Tokyo. The ground in front of the station may be used as an aeroplane station in the future. A police box, public telephone and electric clock will be built on the bridge. The cost is estimated at Yen 1,000,000.

New Bridges, Tokyo.—The Tsukiji bridge in Kyobashi-ku, Tokyo, will be rebuilt at a cost of Yen 260,000, in order to correspond with the widening of the new street to 100 feet. The present Kyobashi bridge will also be rebuilt in steel and concrete at a cost of Yen 110,000.

Fuji River Steel Bridge, Japan.—The Fuji-Minobu tramway company will construct a new and 15 feet wide, estimated to cost Yen 200,000. To be completed April 1921.

WATERWORKS

4.681,380 yen, for the extension of the Dairen Kamakura. Water Works. This is known as the "Third Period," and the expenditure of the sum stated is New Steel Hangars, Japan.—The Japanese mili-707,995 yen in 1924.

It is stated thaat the source of supply is to be at Lung-Wang-Tang, 22 miles from Dairen, where a reservoir is to be built, covering some 93 acres,

with a depth of 120 feet.

The electric power house, of 1,200 kilowatt capacity, for pumping the water to Dairen, is to be established in Port Arthur, though, of course, the pumps themselves will be at Lung-Wang-Tang. The main pipe will be of 18 in. and the supply pipes of 16 in. diameter. Details of costs are as is expected to amount to Yen 50,000. follows :-

| Yen. | Yen. |
|--------------------|---------------------|
| Reservoir1,524,400 | Buildings 18,500 |
| Pumps 84,000 | Setting main |
| Power house and | pipes 631,000 |
| transmission of | Tunnel work 255,000 |
| power to re- | Setting supply |
| servoir 314,000 | pipes1,184,500 |
| Machinery 100,000 | |

With the completion of this work there will be available 20,000,000 tons of water, sufficient to supply a population of 300,000 persons.

Chapei Chinese Want Better Water Supply .-The Chinese residents of Chapei (Shanghai) have protested to the provincial government of Kiangsu, demanding a proper extension of their inadequate waterworks. The manager is reported to have resigned in disgust. The waterworks are under provincial control.

BUILDINGS

Important Government Housing Scheme, Japan. -The Japanese railway department has designed a plan to submit to the Diet to construct houses for 40,000 employees at a cost of Yen 100,000,000, spread over a period of ten years. The average estimated cost for each dwelling, including land, is Yen 3,000.

coming year, at a cost of Yen 4,000,000.

Osaka Medical University .- Owing to the higher costs of materials and construction, the Osaka prefecture has voted an additional Yen 1,800,000 to complete the university within the year 1922.

Soochow Y.M.C.A.—During the summer of 1920 a campaign was started for collecting a fund of \$40,000 to erect a Y.M.C.A. building in Soochow. Plans have been drawn up by Mr. D. S. Yien, engineer-in-chief of the National Federation of Y.M.C.A.; work is expected to commence soon.

departments are to be in Nanking and some in ing the same period comes third in value, represent. British and Americans especially Americans asking

Dr. P. W. Kuo.

shareholders held on November 27, Mr. K. Take- motor-trucks. mori was elected president of the new company, which has paid-up the first installment of its capital Dairen Waterworks.-In the supplementary bud- of Yen 3,000,000. It is hoped that construction get of the Kwantung government, which has been work will be shortly commenced in the new Sonan passed by the diet in Tokio, appears an item of Hotel at Zushi, the popular beach resort near

to be spread over a period of five years, as follows: tary authorities will erect two steel hangers with _433,500 yen in 1920; 1,192,495 yen in 1921; concrete foundations at the Kagamiga-hara aviation 1,243,895 yen in 1922; 1,103,495 yen in 1923, and field, at a cost of Yen 1,000,000, to house the 69 machines received from Germany.

> Settlement Hall, Tokyo.-The Tokyo Municipality will construct a "Settlement Hall" in 1921 at a cost of Yen 52,000.

New Hotel, Nagasaki.-Japanese and Chinese merchants in Nagasaki are planning to establish a hotel and restaurant on the site of the late Mr. Boeddinghaus's residence at Deshima. The capital

New Municipal Buildings, Singapore.—The building of a new General Hospital in Singapore for the Colony will shortly be commenced. It will provide for 300 beds as against 100 at present, and for a further extension of 200 beds. A new District Hospital is also to be built in Singapore, to meet the needs of the native population. Other large works, which are at present under consideration, comprise a re-construction of the Medical School, a new Lunatic Asylum, anl a Tuberculosis Hospital. Suitable sites for the two latter have been selected in a healthy rural district, well outside the town of Singapore.

Hankow Tobacco Factory.-A large tobacco factory for the curing of tobacco is now being erected at Hankow, Honan, by the Nanyang Brothers Company. The design of the factory as well as the supervision of its construction is in charge of the Pacific Trading Co., Engineers.

Japanese Hospital for Shanghai.—A large hospital on modern lines will shortly be established in Shanghai by Japanese merchants, and will cost one million yen. The funds have already been subscribed by the principal Japanese firms in Tokyo having trade relations with China.

Building .- The Y.M.C.A. at Wuchang recently let a contract for the new association building to be erected in the center of Wuchang. It is planned to start construction immediately under the supervision of the Y.M.C.A. New Industrial Schools, Japan.-The education engineers and it is estimated that the work department reports a total of 37 new industrial will be completed in ten months. It will be a and commercial schools to be built in Japan the modern re-inforced concrete building with all the necessary accommodations for a building of this character.

MACHINERY

Canadian Trade with China. - Among a very general accession of (Chinese) business in practically all directions a noticeable point is the apparent mounting up of Canadian side by side with American machinery, the figures for the former being gold miner Tomoef who have come to Blagovestto value of Hk. Tls. 355,565 and the latter chensk have seen the representative of the mining 1,412,196. These figures must, however, in the department of the Blagovestchensk government interests of accuracy be regarded with caution in and asked for the right of mining of dust gold for New University, China.—At a recent cabinet view of the fact that it is probable that a good deal a term of three years, the condition being that meeting, the decision was reached to organize a of American machinery finds its way across the after the term the mines and all the plants will second national university in China to be known as Canadian frontier and is shipped thence in Canadian be transferred to the Blagovestchensk government. the National South-Eastern University. Some bottoms here. Machinery from Great Britain dur- They obtained the concession. There are many

Shanghai. Organization has been entrusted to ed by Hk. Ils. 740,929 and Japan by 32,153. Another interesting feature in the returns and bearing some analogy too to those for machinery in relation New Hotel at Zushi, Japan .- At a meeting of to Canada, is the importation of motor-cars and

| America | 12. | 100 | | asyld - | | 312 |
|-----------|-------|-----|-------|---------|-----|-----|
| France | | | | | | 1 |
| Great Bri | itain | 1 | | | | 16 |
| Japan | . 25 | | Desi- | | *** | 3 |
| Canada | | | | - 45. | | 72 |
| | | | | | | |

Here again the Canadian returns require to be read with caution. It is somewhat deplorable that such an overwhelming preponderance of American over British cars should exist in Shanghai but that our fellow nationals may take heart of grace let us quickly record that as well as her 16 cars Great Britain sent here one motor-scooter.—British Chamber of Commerce Journal.

Demand for Machinery in Australia.—It may be safely stated that New Zealand will be obliged to spend vast sums in machinery. Woollen machinery is needed by existing woollen companies for replacement and extension of plant, and by new woollen companies, of which there are already two in the field, with every prospect of a third being formed shortly, says the Trude Promoter, of Sydney. Electric and power plants, electric cars and accessories are urgently needed. Dairy machinery and plant is also in request, and this covers butter and cheese plants, powdered milk, condensed milk and plants for dealing with the extraction of sugar of milk and casein. Mining machinery is also wanted, and building materials and builders' ironmongery are also in urgent demand. The materials cover everything needed in respect to brick, stone, concrete and wooden buildings: Corrugated iron, roofing tiles, porcelain baths, windows, doors, glass, hinges, locks and all the other items that go into the construction of dwelling houses. The government has let contracts for nearly 600 workers' homes, and in addition private enterprise is engaged in the construction of more than double that number. Owing to the urgency of providing dwellings for the people the government has found it necessary to exercise a measure of control, and buildings that are not a matter of urgency are being stopped and the available labor and material turned over to the necessary works .--The World's Salesman.

MINES, MINERALS AND METALS

New Phosphorus Mine, Japan.—The Mitsui engineers have discovered a great phosphorus mine on Taisho island in Okinawa prefecture, estimated to contain 15,000,000 tons of rock containing 28 per cent. of phosphorus. It is reported that the government steel works at Yawata has decided to purchase the output in preference to its supplies now being imported irom abroad.

Kawamota Silver Mining Company, Ltd,-Organized in Tokyo with a capital of Yen 1,500,000, one quarter paid up, to operate mines. Office, 11 Sanchome Hirakawa-cho, Kojimachi-ku, Tokyo. Managing Director, K. Ishii.

Gold Mining in Amur Province .-- According to a report British gold miner Windo (?) and American for gold mine and trade in Amur province.—Ex- for mining sulphur. Office, 9 Yusoku-cho, Kyo change.

Tongshan Colliery Investigation.—As a result of the recent mine disaster at the Tongshan Colliery of the Kailan Mining Administration in which 425 Chinese miners lost their lives, a joint investigation is being conducted by the ministries of foreign affairs, interior, communications, and agriculture and commerce, with the object of determining as far as possible all the facts in the case, having in view the introduction of new laws for the protection of miners and other workmen.

Iron Mine in Chenkiang, Kiangsu.—An iron mine has been discovered in Pei-kung-toong mountain, about four miles from Chenkiang, a city lying on the south bank of Yangtze River, and along the line of the Shanghai-Nanking Railway. Funds are being raised for developing it. The ores have been found to contain 70 per cent. of pure iron and 30 per cent. of impurities. The quality is as fine as those of the Tayeh mine in Hupeh.

Minerals in Kowloon.—Five mining engineers are at present in Hongkong awaiting the arrival of drilling apparatus to begin prospecting for minerals and coal in the New Territory. The enterprise is backed by a substantial Anglo-Chinese syndicate. That iron exists in the New Territory is an established fact. Sir Paul Chater, some years ago, formed a company for the purpose of working an iron mine in the neighborhood of Taipo, but failure to find coal in the vicinity caused the indefinite postponement of mining operations. A Company to undertake dredging operations for tin was also formed in the Colony some seven or eight years ago, but sufficient tin was not found to make it a profitable enterprise.

Korean-Russian Co-operation. — Koreans Blagoveschensk have organized a gold-mining association. They have been granted a permit, on condition of delivery free of twenty per cent. of the gold extracted to the Blagoveschensk government.

French Tonkin Mines .- Raymond Ferrant, general manager of Charbonnages du Tonkin, has given out the following information relative to the operations of his company:

"Our property in Indo-China is the largest coal mining project in the world covering an area of 22,000 hectares or more than 50,000 acres. Present annual output is about 800,000 tons, and our engineers estimate that the property would support that average production for about 40,000 years. Coal is of excellent quality running higher in carbon than ordinary bituminous. Volatile matter runs about 9 per cent, and ash 6 per cent. The coal is clean and the ash shows no fusibility.

"Our coal is not sold in the European market but goes to Japan and China principally. One large Japanese firm has contracted for a large quantity of coal, which will be marketed in Scandinavian countries.

"Our products are sold f.o.b., ordinary coal bringing \$5 silver a ton and screened coal selling at \$8.50 a ton. We are being pressed to supply coal to the European market but have made no contracts as yet.

"There have been no labor difficulties practically all labor is native. We employ about 10,000 men, only 60 of whom are Frenchmen."

Discovered in Japan.—The Rich Gold Mine recently discovered gold mine in Amagi mountain is said to have a vein, six to seven feet in width, and can be traced for seven miles.

Tamatsukuni Mining Company.—This is a limited partnership organized with a capital of Yen 150,000 bashi-ku, Tokyo. Managing Director, T. Uyeki.

COAL

Kamikuni Coal Mining Company, Ltd.-Organized in Osaka with a capital of Yen 1,300,000, quarter paid-up, to engage in coal mining. Office, 18 Honda Niban-cho, Nishi-ku, Osaka. Managing Director, Genji Konishi.

Chinese Coal to England .- Ten thousand tons of Chinese coal is en route for England. It is of excellent quality, and can be sold cheaper than British coal. Chinese Republic's coal reserves are estimated to amount to 1,200,000 tons. Her present output capacity is estimated at 30,000,000 tons, of which 20,000,000 tons are consumed at home. Coal exports from China have been running between 1,000,000 and 2,000,000 tons annually, since 1913. The price of Chinese coal at the pit mouth, at the end of last month, was 2 shillings and 4 pence. Production costs show little change over a period of years.

Imperial Fuel Company, Ltd .- Organized ir. Japan with a capital of Yen 500,000, one quarter paid up, to operate coal mines. Office, 3 Nagawa sawacho, Kyobashi-ku, Tokyo. Managing Director, M. Okada.

Kansu Coal Mining .- There are 12 small companies engaged in coal mining in the Siningfu district. The coal mines are situated in the hill in the North Valley, 27 miles northwest of the city. The system of working them is crude. Nevertheless the mines are some 150 to 200-ft. in depth and somewhere near 9,000,000 catties or 5,000 odd tons of coal are dug out every year by means of punches and hammers only. In the winter time about 140 or 150 carts are regularly in use carrying the coal to the cities of Sining, Huang-yuen and Tatong, as well as to the district round. In the summer only 80 odd carts are in use, as the farmers are busier. Boys of tender age are employed in the mines to carry the coal from the place of working to the pit bottom and it is drawn up in hides. Relays of men, chiefly blind men, are engaged in drawing the water from the mines day and night without ceasing. In recent years a tax has been levied on the coal owners to support the Police Force. There is not much demand for the large pieces of coal, save in the Yamens and among the better class who burn it in open large brass basins or in stoves. The small coal is in greatest demand, for it is used by the people in the cities and large towns where other fuel is scarce, to make their food, the fire being kept burning by means of the wind box. It is also used to heat the kangs in winter on which the would be worked. The Association would be compeople sit and sleep and is free from the strong odor that manure always carries with it. The very poor people use manure. The coal dust is mixed with cow manure and made into bricks, which are also used for heating the kangs and are, further, burnt in the brass basins, to keep the hands warm as well as to boil tea or hotwater. Coals are sold at 8 to 10 cash a catty according to demand. The smaller kind is sold by measure 35 cash per shen and the coal bricks at 13 cash each.

OIL

Shale Petroleum Company, Japan.—Dr. 8. Yonekura, formerly chief of the South Manchuria Railway coal mines, has invented a process to extract crude petroleum from coal and shale and is projecting a company with a capital of Y.20,000,000 with the aid of the navy department and certain

capitalists. It is proposed to establish the plant somewhere near the Sumitomo copper works at Ajikawa, Osaka, whose capacity will be 1,000,000 tons of oil from 10,000,000 tons of shale and coal.

Japanese Oil Output Declining .- The petroleum oil output in Japan continues to decrease. Latest returns based on the investigations of a certain mining company in Tokyo give the total quantity of crude oil produced at all leading oil fields throughout Japan during the first half of the present year as 961,755 koku (1 koku is equal to 39.7033 gallons), the figure showing a decrease of 3,365 koku compared with the yield of the corresponding period of last year. The output of the oil field in Hokkaido, Akita and Yamagata showed more or less increase compared with the previous period, but the figures for other prefectures generally decreased, as will be seen from the following table:

| | | JanJune 1920 | JanJune 1919 | Decrease for 1920 |
|----------|-------|-----------------|-----------------|----------------------|
| | | (Figure in | koku) | |
| Hokkaido | | 4,013 | 3 2,968 | Inc. 1,045 |
| Akita | | 427,512 | 370,222 | Inc. 57,290 |
| Yamagata | | 30 |) — | Inc. 30 |
| Niigata | | 529,503 | 591,101 | 61,598 |
| Shisuoka | * * * | 630 | 671 | 41 |
| Nagano | 4.55 | 67 | 98 | 31 |
| Total | * * * | 961,755 | 966,060 | 3,305 |

Oil in Borneo.—The Kuhara firm has been prospecting petroleum oil in Borneo since 1919 on a concession acquired there with an area of 30,000 square miles, and hope of success has just been reported. It is also stated that the Japan and Hoden Oil Companies are jointly carrying on negotiations privately for the buying up of an oil company in Dutch-Indies.

Tayabas Boom. — The Richmond Testing Petroleum Co., a subsidiary of the Standard Oil Co. of California, will commence drilling for oil early this year on a large tract of land in Tayabas province, Philippine Islands. Twenty-seven American experts have arrived in Manila to supervise the work.

INDUSTRIES

J. O. P. Bland Organizes British-China Trading Corporation.—In 1919 a charter was obtained from the Chinese government by certain British traders for the purpose of developing an industrial area in China outside the limits of the Treaty Ports. At a meeting held yesterday (November 4, 1920) at the offices of the Federation of British Industries Mr. J. O. P. Bland outlined the scheme under which a British-China Trading Corporation posed of British and Chinese firms. Eventually a committee was formed under the chairmanship of Sir J. Kemnal for the purpose of taking the necessary steps to inaugurate the Corporation on a sound basis. Its members are: Messrs. E. F. Oldham, S. Springer or H. Hobden (representing the Federation of British Industries), J. O. P. Bland, John Noble, C. E. Tatlow, R. M. Bewick, and R. G. Perry, with power to co-opt others.—London Morning Post.

Woollen Factory for Lhasa .- The Dalai Lama wants estimates for an up-to-date woollen factory to be put up at Lhasa. Negotiations are proceed-

Water Power Concession, Java.-A concession for 40 years has been granted for the use of the waters of the river Moesi, above Bankoelen, solely for the purpose of manufacturing synthetic nitrogen compounds (fertilisers and the by-products of their

to the port.

Rengo Paper Manufacturing Co., Ltd .- Organized in Tokyo with a capital of Yen 2,000,000, quarter paid-up, to engage in manufacture of paper. Office, 1 Itchome Tarhei-cho, Honjo-ku, Tokyo. Managing Director. J. R. Geary.

year, to be erected upon Maria Island, off the east in the purchase and erection of a plant for de- The sales office will be in Shanghai. veloping 500 tons of cement per week.

ed capital of Rs. 25 lakhs a cement manufactory is establishment of a cotton mill at Mukden. The ber trees are growing successfully.

the right to mine the necessary coal and lime need- manufacturing a ton of cement at about Rs. 35 a 100 looms, represents an outlay approximating ed from the formation around the power station, ton, the promoters count upon a liberal margin of \$700,000. The entire plant is to be modern in as well as to construct a railway from the works profit after meeting all expenses. The managing every respect and operated as an official venture. agents are to be Messrs. Rajagopal & Co., of The cultivation of cotton in the Mukden district Madras.

Proposed Sugar Refinery, China.—Mr. Y. S. Mar, a returned Chinese merchant, together with leading confectionery merchants in China, originally selected Nantungchow or Woosung, as the site for a new plant, but now Mr. C. Y. Kuo, one of Cement Industry, Tasmania. - Efforts are being the directors of the Chinese Overseas Federation, made to float a company with a nominal capital promises to co-operate with him, and they will of £600,000 for working a plant with a minimum erect their plant at the new harbor of San Man capacity of 38,000 tons of high-grade cement per Bay in Fukien with a capital of \$5,000,000 silver.

coast of Tasmania, where it is said extensive lime- Proposed Brewery, China,-Mr. F. C. Zia is stone deposits exist. The company is to he known planning to erect a brewery, with a capital of one as the National Portland Cement Company, Ltd., million yuan at West Lake near Hangchow. Water the address being, Equitable Buildings, Collins from this lake has been analyzed and found impure, Street, Melbourne. £40,000 are to be expended so a well is to be sunk for the supply of water.

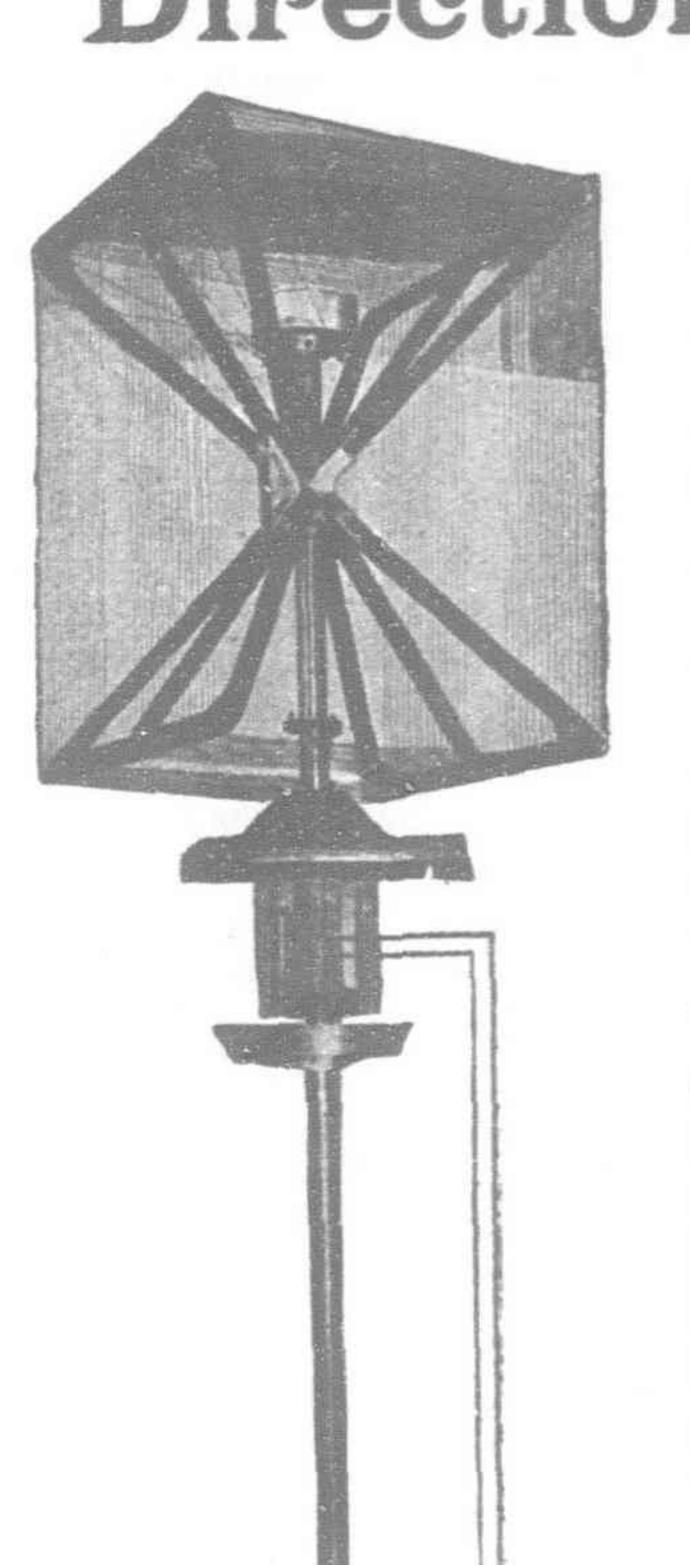
manufacture). The concession also carries with it to be started at Bezwada. Calculating the cost of requisite machinery, including 10,000 spindles and is being promoted to supply the needs of the mill.

> Taisho Iron Works Company, Ltd .- Organized with capital of Yen 500,000, quarter paid-up, for general iron and foundry work and manufacture of bolts, nuts and rivets. Office, 24 Kobosije, Shimonoseki. Managing Director, Tokujiro Nakamura.

> Yogyu Gas and Electric Company.—Organized as a limited partnership for the manufacture of electric machines and tools. Office, 158 Toyasakimachi, Nishinari-gun, Osaka-fu. Representative, Tetsusaburo Yogyu.

Rubber Goods Factory, Canton, -A factory for manufacturing rubber goods has recently been successfully organized in Honam, Canton. It is understood, says the Canton Times, that the manu-Cotton Mill, Mukden.-Corsul Pontius reports factory is obtaining raw rubber from Kiung-chow New Cement Factory, India.-With an authoriz- the contract with an American firm covering the and Ngaichow, in the island of Hainan, where rub-

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Kyowa Celluloid Company, Ltd .- Organized in Japan with a capital of Yen 50,000 for the manufacture of celluloid. Office, 2080 Kameyedo-machi, Tokyo-fu. Managing Director, Y. Wakai.

Tokyo Metal Works .- Organized as a partnership for general metal work and manufacture. Office, 238 Tsurumaki-cho, Ushigome-ku, Tokyo. Manager, K. Kitayoshi.

Kamitoku Iron Works.-Organized in Osaka as a partnership to engage in general foundry, machine work, and manufacture of machines .and tools.

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Office, Kitanagai, Toyasaki-machi, Nishinari-gun, Osaka-fu. Representative, Ryutaro Sayama.

with a capital of Yen 1,000,000, fully paid up, to as is desired. engage in general lumber and saw-mill business. Office, 1 Itchome Yaisu-cho, Kojimachi-ku, Tokyo. Ho Feng Cotton Mill (Ningpo) is reported to Managing Director, Kyohei Kato.

agriculture and commerce of Japan, has made a spindles, and these were increased from time to start in the appointment of its engineers and has secured the land to the extent of 12,000 tsubo at by 1922. The results of all tests will be made public for the benefit of general industry.

Tea Machinery Factory. - The Tanaka Company was recently organized as a partnership for the manufacture and sale of tea machinery. Office, 2054 Katsumata, Kawasaki-machi, Shidzuoka Prefecture. Representative C. Nonaka.

Signalling Machines .- The partnership company, Morita Shoten, has been organized in Japan for the manufacture of signalling machines. Address, 27 Yegawa-cho, Kobe. Representative, Kamekichi Morita.

Kitahiro Iron Works .- Organized as a partnership for general machinery work. Office, 2491 Tokinogawa, Itobashi, Tokyo-fu. Manager, K. Hirase.

Nagasaki Meter Company, Lid.—Organized with capital of Yen 25,000, half paid-up, for manufacture of meters. Office, 15 Take-cho, Shitaya-ku, Tokyo. Managing Director, T. Furuya.

Silk Filatures in China .- According to the statistics of the silk merchants guild, the number of filatures at different centres in China is as follows: Kiangsu Province: Shanghai, 78; Soochow, 3; Wusih, 11; Chenkiang, 2. Chekiang Province: Hangchow, 1; Shiou-shan, 1; Huchow, 1. Hupeh Province, 1; Hunan Province, 1; Anhwei Province, 1; Yunnan Province, 1. The total annual production from these filatures is 358,000 piculs, and, if no interruption occurs, the maximum is 400,000 piculs.

Proposed Dye Works, Japan .- The Nagoya cotton yarn association is considering a scheme to establish a dye works in that city.

Mannen Tile Manufacturing Co., Ltd.—Organized in Tokyo with a capital of Y.1,000.000, quarter paid up, for the manufacture of tiles. Office, 8 All of the equipment in the mill will be of Ameri- the season. The company is also willing to differ. Honda-mura, Katsu shika-gun, Tokyo-fu. Manag- can construction. ing Director, Sashiro Ishii.

Organized in Nagoya with a capital of Y.100,000, and 1,200 looms. Five hundred k.w. power plant quarter paid up, to engage in the manufacture of and 10,000 spindles are now running; 40,000 more paper and deal in paper stock. Office, 4 Shichome spindles and 200 looms are on order, the machinery Miya-machi, Higashiku, Nagoya. Managing Direc- being all American. tor, M. Takagi.

Ltd.—Organized in Tokyo with a capital of paper absolutely non-tearable, says La Journee Y.350,000 one quarter paid up, for manufacturing Industrielle. It proposes to use the new preparation paper and general printing business. Nichome Nishi Ogawa-machi, Tokyo. Managing tary cards, stamps and umbrellas. Director, Otozo Wakao.

fectural government is busy now preparing for the recent registery of the following new enterprises :big exhibition of industrial machinery to be held Cotton mill: 16 next July, according to the Jiji. The present Mining Cos.: 12 plans, for the carrying out of the preliminary pre- Electrical Cos.: 26

parations of which the administration is asking Transportation Cos.: 18 Capitalization: \$ 6,866,000 Y.1,000, calls for a building covering 15,000 tsubo. Trading Cos.: 15 Uyeno Park seems to be the most suitable location, Agricultural & Forestry Cos. : 16,, Karafuto Lumber Co., Ltd .- Organized in Tokyo but even it does not offer as large an open space Manufactories: 53

have made a net profit of \$1,250,000, on a paid up capital of \$600,000 at its inception, which has been Fuel Investigation Laboratory.—The fuel inves- during recent years increased to \$1,800,000. This tigation and testing institute of the department of mill was established in 1906. It then had 12,500 time to 27,500.

Kawaguchi-machi in Saitama prefecture, for the New Tannery in China. Y. S. Chen, son of Jan erection of its plant. This is estimated to cost Kon-chen, Chief Justice of the Supreme Court of Yen 1,000,000. This is expected to be completed China, was in Chicago recently conferring with tanners and chemists on the tanning industry. He is a graduate of Michigan University, also of three companies are established in Java. Columbia and has devoted most of his time and education to chemical research. He states that there is a good market for sole leather in China and the tannery which will be built at Hankow will be used largely for the manufacture of bottom stock.

> New Spinning Machine Company, Japan.—The Oriental spinning machine company, organized last year, is the first of its kind to be established in over imported machine in respect of cheaper price. which are to correspond to the terms of agreement. Fuji Spinning Company and a few silk yarn reeling factories in Nagano and Shiga prefectures. The company has also succeeded in the manufacture of spindles.—Exchange.

mill.

\$10,000,000 when completed, including land, white fox. This payment includes the remuneramachinery and building construction. The mill tion to the inhabitants for carrying on the indusconverting waste, and 600 looms for weaving cloth. for a year the amount to be calculated according The daily output will be 100,000-lb. of cotton yarn. to date of the number of skins obtained during

Honan, formally opened on June 13, has a power try. (6) The sea-bear, beaver, and fox industry Paper Manufacturing and Material Co., Ltd .-- plant and picker rooms enough for 50,000 spindles is to be carried on by help of local residents. The

Non-Tearable Paper.—The Japanese government Oriental Paper Manufacturing and Printing Co., recently took out a patent for a liquid which makes Office, 9 in the manufacture of paper for bank notes, mili-

New Chinese Industrial Enterprises.—The minis-Machinery Exhibition, Tokyo.-The Tokyo pre- try of agriculture and commerce reports the Capitalization: \$ 6,673,000 9,492,785 3,123,785

13,373,000 21,721,300 21,721,300 Fishery Cos.: 3 1,055,000 Other enterprises: 8 2,463,000

Looms from America but German Power.-The eighth branch factory of the Dah Sung Cotton Mill, of Nantungchow, is to be at Sze-yang-pah on the southern bank of the Grand Canal. Building will begin at once. Six-hundred power looms have been ordered from America and are expected to be delivered in July. German motors will be used.

Javanese Oil Factories Amalgamation,-The Insulinde Oil Factory, the United Oil Mills and Van Dongen Oil Factory are about to amalgamate. All

FISHERIES

Sea-Bears Concession .- Kuhara & Co. have proposed to the Fish and Fur Industries Council of Vladivostok an agreement for the exploitation of the Commander Islands, the Behring and Medny (copper) islands, the abode of sea-bears, beavers, Japan. The company has purchased the Toyo Iron and white and blue foxes. At different times Works, Limited, formerly engaged in the manu- these islands were leased to various commercial facture of parts of spinning machines and repairs companies, foreign and Russian, but since 1917 of these machines, and has accomplished the pro- they have remained untenanted. Kuhara & Co. cess of manufacturing the whole set of spinning offer the following terms:-(1) The lease is to be machines by improving and amplifying the manu- made for a term of ten years from 1921 to 1931. facturing process conducted by the former estab. (2) The exploitation of the islands is to be carried lishment. The machine constructed by the new on by Kuhara & Co. in compliance with conditions establishment is modelled after the German silk to be worked out by both parties, and with the existspinning machine known as Hartmann system ing laws and regulations of international guarding machine. Compared with the German machine the of sea-bears and beavers, under the control of a manufacture of the company is by no means infer- person, authorized by the Russian authorities and ior in the result of operation and has an advantage furnished with due instructions, the contents of The company has already received orders from the (3) The company is to be granted the right of complete exploitation of the islands, i.e., killing seabears, beavers, foxes, and likewise the right of fishing and catching sea-animals along the shores of both islands. (4) The time, place, method employed, and number of animals to be killed, is New Cotton Mills, China.—Machinery is now to be determined by a special instruction. (5) The being rapidly installed in the Pao Cheng Cotton company is to make payment to the government for Mills in Shanghai, the largest enterprise in China. each skin obtained on the islands and offers to It embraces cotton spinning, weaving and a waste pay 14 gold roubles apiece per sea-bear; 450 gold roubles per each beaver skin, 46 gold roubles per The total cost of the enterprise will be close to skin of blue fox, and 12 gold roubles per skin of will include 100,000 spindles, 6,000 spindles for try. The company is willing to advance payment entiate the payment into payment of rent, and The Yu Foong Cotton Mill at Changchow in payment to the inhabitants for carrying the induscompany is allowed to keep on the islands an indispensable force of its own employees (clerks). (7) The company assumes the obligation of establishing fox burseries and scientific observation work. (8) The company undertakes the complete business of supplying the population of the islands with everything necessary and to sell the supplies at the prices prevailing on the markets, where they were purchased, plus the cost of transportation, and commercial expenditures, this, however, is not to exceed 15 per cent. of the market prices.

AIRCRAFT

Philippine Aerial Service.—An air mail and passenger service between Manila and other ports

flying personnel will be formed of 30 officers of the Philippine National Guard.

Sino-America Aviation Co.?-A Sino-America Aviation Co. is being promoted in Shanghai for "carrying cargo and mail between Shanghai and U.S.A. and to other parts of the world later on " by a Mr. Y. K. Shen. The Shun Pao says: "The capital is being fixed at \$100,000, U.S., to be divided into one thousand shares of a hundred dollars each, with \$30,000 gold to be paid up at the beginning. This company will be registered with the American government. At present, two members of the General Chamber of Commerce of Shanghai have invested in this enterprise. The Board of Directors of the company will consist of Chinese and Americans in equal number."

Shanghai-Peking Line .- The aviation department, Peking, reports that the survey for the Shanghai-Peking line, China's first aviation service, has been completed. Particulars: Length: 908 miles. Two main stations-Shanghai and Peking; four sub-stations-Tientsin, Tsinan, Hsuchow and Nanking; and eight emergency stations. Ground costs \$165,000.

ROADS

Kobe Road Program.—Kobe will soon start to improve its roads at a cost of approximately Y.14,819,029, of which sum the central government pledges a subsidy of one-third. The work will be spread over 16 years, beginning with the current fiscal year.

The subsidy from the national coffer amounts to about Y.4,707,675 of which Y.50,000 and Y.70,000 will be defrayed in 1920 and 1921 each, Y.150,000 in 1922, and from 1923 to 1930, Y.350,000 will be given yearly, from 1931 to 1934, Y.400,000 annually and Y.267,675 will be disbursed in 1935, in which year all the works are to be completed.

Shanghai-Minhong Motor Road.—A motor road is being surveyed from Shanghai to Minhong, a town some fifteen miles to the west of Shanghai.

Shanghai-Liuhoo Road.-Survey for an automobile road between Shanghai and Liuhoo, a town some twenty-four miles to the north-west of Shanghai, is in progress. The cost is estimated at about \$170,000.

Paoshan Roads.—Two main roads are proposed Shanghai to Lutien, and (2) from Woosung to Kwuanfoh.

Road Construction at Canton .- The government of Kwangtung has formed a Public Highway Commission with Chen Tet-sen as the chief. Among the proposals suggested are (1) public organizations, private companies, or individuals in the several districts may undertake the construction of the proposed highway; (2) agreements will be entered into by the government and the party interested in the building regarding the responsibility and the privilege to be enjoyed and carried by the people and the contractors concerned; (3) that the government shall not interfere with the operation of the road building contractor, individual or company; (4) until the charter expires, the party having successfully built the highway shall be permitted to enjoy the income and other privileges attached to the road and other benefits to be agreed upon; (5) the government

in the Philippines is being organized. The war will reclaim the highway at the termination of the department announces that it has purchased five agreement so that, within a stated time, the Pubseaplanes from the navy department and that the lic Highway Department will control all public roads and make future improvement on them. There are now 16 miles of the city roads open to traffic, while some 30 miles are still under construction. The roads are either 70, 80, 100, or 150-ft. wide, all depending upon the importance of the thoroughfare.

> Along the side-walks of the roads of but 70-ft., trees will be planted, and no electric cars will be permitted to run on them; they will be for the rickshas and other trackless vehicles only.

> No trees will be planted on the side-walks along streets of 80-ft. wide, but porches may be built over them. These streets will admit of a tramway.

> Trees will be planted in the middle of the streets 100-ft. wide and over the side-walks of these roads porches may be erected by the owners of residence abutting on the road.

> There will be a motor-road from the Canton-Kowloon Railway Station to Sha-ho, with two branches, one running to the White Cloud Mountain, the other to Yin-tong. On the sides and in the middle of this road, trees will be planted.

> Wuan-Hantan Road, Honan .- Plans for the projected Wuan-Hantan road have been taking shape and preliminary work has gone on apace. About five thousand men will be employed.

MOTORS

Autos for Honan.—The military governor of Honan proposes to build a road from the north gate of Kaifengfu, capital of Honan, to the Yellow River, a distance of about fifteen miles. From that point a good cart road follows the river to Tsinanfu, capital of Shantung. The governor proposes to establish a motor bus line between the capitals.

Nippon Shoji Automobile Company, Ltd .- Organized with capital of Y.1,000,000, quarter paid up, for the manufacture and sale of automobiles. Office, 6 Itchome Uchisaiwai-cho, Kojimachi-ku, Tokyo. Managing Director, N. Kawasaki.

Hoki Automobile Company, Ltd.-Organized with capital of Y.30,000, half paid up, to engage in general garage business. Office, Hoshoji-mura, Hoki prefecture. Managing Director, K. Nakira.

Chinkai and Chiusho Automobile Company in Korea. - This firm has received permission to extend their services to Shasen on the Keiwado line.

to be built (1) from the northern extremity of Motor-Cars in Java.—The special requirements erally fully felt in Japan, but in the banks money of a car for the Dutch East India market are an is very abundant at present, since they have been adequate cooling system, as the climate is, we all refusing to extend credit for some months past. know it too well, "tropical"; the engine must The government proposal is therefore considered be sufficiently powerful and flexible to take easily by the bankers as a timely undertaking. the numerous hills, and to cover long distances; a The issue was agreed upon on the following stout transmission system and large and strong terms :springs are most important points for manufacturers. Special care should be taken in packing cars for Java, as several cases have been reported where parts have been stolen. Many consignees appear to leave their freight in the dock warehouses until they are ready to take delivery. There are over 12,000 cars in use in these territories, and almost all imported since 1915 have been of banks, and so the issue will result simply in of American manufacture. Before that, French changing the British bonds into Japanese bonds, and Italian cars predominated, and already there from the financiers' point of view. The British are signs that the manufacturers in these two bonds will then cease to exist. Specie, it is recountries are making strenuous efforts to regain the ported, is already arriving there from the British market, and no doubt they will, as big profits were government for the repayment. made in the past three years in Java. (Java Motor Age.)

GOVERNMENT FINANCE

Japanese Budget, 1921-22.—The Japanese budget for the fiscal year of 1921-1922 shows the following comparison with the budget for the fiscal year of 1920-21 :--

Depart-

| ment | 1921-1922 | 1920-1921 | Increase | Decrease |
|--------------|---------------------------|---------------|--------------------------|---------------|
| Ordinary : | Expenditure | 2: | | |
| Civil List . | Y.4,500 000 | Y.4,500.000 | | |
| Foreign | | | | |
| Affairs . | | 10,847.147 | Y.7,641,164 | |
| Home Af- | | 04 550 005 | 6 001 005 | |
| Finance: | 40,860.512 223,146.614 | 100 777 4 410 | 6,081.605 | |
| Army | 183,290.831 | 155,942 414 | | |
| | 144,811.078 | | 27,348.417 35,747.709 | |
| | 27,242 184 | 99 158 678 | 5 082 506 | WITH THE REAL |
| Education | 33,938.167 | 27,675,764 | | The Late |
| Agricultur | e | 21,010,101 | 0,202 100 | |
| & Com- | | | | |
| merce . | 19,377,811 | 15,311.651 | 4,066,160 | - |
| Communi- | | | | |
| cation . | 207,285,315 | 152,105.419 | 55,179.896 | _ |
| Total | 902 94.,823 | 725,157,759 | 177,783.064 | |
| Extraordin | ary Expend | diture: | | |
| Foreign | | | | |
| Office . | 3,130,574 | 4,149.542 | | 1 010 000 |
| Home . | 0,100,014 | 2,140,042 | _ | 1,018,968 |
| Office . | 76,426.341 | 68,522,139 | 7,904.202 | |
| Finances . | | 131,755.413 | 1 200 2,202 | 96,483.862 |
| Army | 79,855.871 | | 22,373.146 | |
| Navy | | 244,294.516 | 109,531.484 | |
| Justice . | 2,426.472 | | 490.074 | |
| Education | 20,672.879 | 15,882.654 | 4,790,225 | _ |
| Agricultur | | | | |
| & Com- | | | | |
| merce . | 31,303.978 | 27,340.143 | 3,963.835 | _ |
| Communi - | | | | |
| cations. | 56,690 308 | 58,836.019 | | 2,145.711 |
| Total | 659,601.974 | 610,197,549 | 49,404.425 | |
| Grand | | | | |
| Total. 1 | ,562,542.7971 | 1,335,355,308 | 227,187,489 | - |
| | | | | |
| | | | | |

Japan Settles the British Loan.—On November 25, the government convened a meeting of the syndicate bankers at the Bank of Japan, to arrange terms for the issue of Exchequer Bonds amounting to Y.50,000,000. The following bankers were present at the conference :-

Tokyo syndicate: Mr. Kajiwara (Yokohama Specie Bank), Mr. Minobe (Bank of Chosen), Mr. Hijikata (Industrial Bank), Mr. Morinaga (Bank of Taiwan), Mr. Sasaki (Daiichi Ginko), Mr. Matsukata (Jugo Ginko), Mr. Ikeda (Daihyaku Ginko), Mr. Z. Yasuda (Daisan Ginko), Mr. Ikeda (Mitsui Ginko), Mr. Kushida (Mitsubishi Ginko), Mr. Yasuda (Yasuda Ginko), and Mr. Nonomura (Kawasaki Ginko).

Osaka syndicate: Mr. Koyama (Sanjushi Ginko), Mr. Yukawa (Sumitomo Ginko), Mr. Kato (Konoike Ginko), Mr. Banno (Yamaguchi Ginko), Mr. Yoshii (Kashima Ginko), and Mr. Ikeda (Omi Ginko).

Nagoya syndicate: Mr. Tsunekawa (Nagoya Ginko), Mr. Omiwa (Meiji Ginko), and Mr. Tashima (Aichi Ginko).

The object of the issue was to absorb the money that the British government will pay in redeeming its Exchequer Bonds floated some time ago in Japan, amounting to Y.50,000,000, and falling due on January 15 next. Financial stringency is gen-

Interest at five per cent. per annum.

Issued at Y.93.50 per Y.100.

The British government exechequer bonds, falling due on January 15 next, are to be accepted in payment at face value.

To be redeemed on March 1, 1925.

The said British bonds are almost all in the hands

New Chinese Rolling Stock Loan .-- The Chinese

ment with \$6 million for the specific purpose of eral Chen Chiun-ming has just received a loan tion for the development of communications. purchasing rolling stock, the shortage of which has of \$6,000 from the Kwangtung Electrical Supply seriously interfered with the transportation of Co. and another loan of \$30,000 from the Canton merchandise. It is proposed that the ministry of Water Supply Company. communications will issue loan bonds to the value of \$6 million. The object of the loan will be stated on the bonds, and the Bank of Communications and the Bank of China will recognize the loan as an industrial loan which is to be subject to the supervision of the financiers in regard to its expenditure.

Japanese Issue Oversubscribed?—The Bank of Japan announces that the subscriptions to the new 5 per cent. exchequer notes, amounted to Y.78,010,000, while the total value of the issue is Y.50,000,000.

Of the total subscriptions, Y.45,300,000 is to be paid in cash, while Y.32,690,000 is to be paid in the maturing British treasury notes.

China May Issue Domestic Bonds.—In order to secure funds for the relief of the famine sufferers in North China the government is contemplating a domestic bond issue. The loan will be floated under the supervision of the ministries of finance, interior, and the famine relief department, and will be secured by the imposition of a ten per cent. tax on the provincial revenues. Each province is to be ordered to buy these bonds in proportion to the amount of revenue to be collected from the imposition of the extra tax in that province which will be deposited with government banks for the payment of capital and interest due on the bonds. The imposition of this extra tax will be enforced for one year and the loan will be entirely refunded within three years from the date of issue.

Bank to Pay Troops .- Having no other means to pay the troops and prevent mutiny, the Hunan government is reported as starting a commercial bank for paying the troops upon the issuance of bank notes to the value of \$3,000,000 silver.

No More Foreign Loans.—The Peking government announces that from January 1, 1921, it will not contract any more non-productive foreign loans. Indispensable political and military expenses in order to avoid supervision of expenditures by ment to improve its finance in three months. foreigners. Thus goes the declaration.

Hard up in Canton .- Being in need of urgent munications proposes that 30 per cent. of the postal

Hukuang Not Outlawed .- Dr. Y. W. Bonds Chan, Hongkong banker, is in New York, enroute from the Brussels' conference, speaking to a representative of The Wall Street Journal on the position of Chinese government Hukuang Railway five per cent. bonds, said :-

"There seems to be a misunderstanding on the part of America regarding China's attitude on the Hukuang bonds. China in repudiating debts to Germany only followed the example of the United States, Great Britain and France. China has not outlawed the Hukuang bonds; she has only outlawed those bonds held and owned by German citizens. She has asked the present holders to prove that they did not buy these outlawed bonds.

"In pursuing this course, China is only asking what the United States, Great Britain and France have required concerning enemy property. China is following your example. It is not fair to her to let American or British bankers buy up these outlawed bonds for thirty or forty cents on the dollar and then compel her to redeem them at par. We cannot believe that the consortium will insist upon China doing so as a condition before making any other loans or advances to the Chinese government."

Provincial Bank of Kwangtung.—The Provincial Bank of Kwangtung, at Canton, resumed its business on December 6. Managing Director Cheng said that there are at present something like \$250,000 worth of banknotes of the bank outstanding, but most of them, except \$30,000 or \$40,000, are now in possession of the previous managing director, Mr. Tsan Hai-chau. Until the number and worth of the banknotes lost during the recent disturbance are ascertained, their redemption will be withheld. The Canton government has already paid in \$1,000,000 of its subscribed stock, and the government will at least deposit \$3,000,000 monthly at the Bank. The Bank will not issue any banknote without security for its redemption on presentation. Mr. Cheng believes that the Bank will will be provided by a Chinese financial syndicate, be in full running order and able to help the govern-

Chinese Postal Surplus.—The minister of com-

Bankers' Syndicate proposes to finance the govern- funds to meet the necssary military expenses, Gen- surplus should be set aside as an annual appropria-

Small Loan for Chinese Education. - With the interest due from the Russo-Asiatic Bank shares as security, a \$1,000,000 loan is being negotiated for the ministry of education. The loan is to be paid in three instalments.

China's Income Tax Postponed.—The Chinese ministry of finance announces that the imposition of income tax has been postponed for three months or until April 1 (!).

New Domestic Loan?—A loan of five million yuan was contracted during the latter part of December between the Peking ministry of finance and a banking group consisting of 7 Chinese banks; interest, seven per cent., secured on the revenues of Peking-Hankow, Peking-Suiyuan, Tientsin-Pukow and Shanghai Nanking Railways; for a period of five years; to be repaid one-fourth annually from the second year and only interest to be paid in the first year .-- Sin Wan Pao.

No Japanese Loan for Canton.—The Peking government, on receiving a report that the Japanese government had given a loan of \$3,000,000 silver to Dr. Sun Yat-sen, Mr. Tang Shao-yi and other Southern leaders, enabling them to reorganize the Canton Military government, filed a protest with the Japanese authorities through Mr. Hu Wei-teh, Chinese minister to Tokyo. The Peking government, later, received a report from Mr. Hu Weiteh in which the Japanese minister for foreign affairs assures him that Japan had never favored the South and had not cincluded any military loan, as was agreed to by the Powers some time ago.

The Chinese Customs Surtax .- The diplomatic corps at Peking has decided that the Chinese customs surtax ought to follow the precedent of the last tariff revision and come into operation two months after the date on which official notice of it was given, becoming effective on February 16, instead of January 16, as was proposed by the Chinese government.

BANKS

Sir John Jordan Director of Chartered Bank .-The Right Hon. Sir John Jordan, P.C., K.C.I.E., K.C.B., K.C.M.G., until last year British minister at

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Peking, has joined the court of directors of the Chartered Bank of India, Australia and China.

High Tribute to Mr. N. J. Stabb. -Mr. N. J. Stabb, who has retired from the chief managership of the Hongkong and Shanghai Banking Corporation, was banqueted by the Chinese merchants and bankers of Hongkong on the eve of his departure for home. Sir Robert Hotung, former chief compradore for Jardine, Matheson & Co., presided and paid a high tribute to the fine record made in China by this deservedly popular British banker. Mr. A. G. Stephen, who is well and most favorably known in Chinese financial circles, has succeeded Mr. Stabb as chief manager.

New Yokohama Bank.-Messrs. Hara, Watanabe. Wakao, Isaka, and other well-known business men of Yokohama have decided to establish a bank, to be called the Koshin Ginko, with a capital of Y.1.000,000, with the object of adjusting the affairs of the 74th Bank of the Mogi interests.

New Chinese Bank in Manila.—Articles of incorporation for a new Chinese banking institution, conducting general banking business on strictly American methods, have been filed in Manila.

New Bank, Korea.—As the Hakwroken Steamship Company are now running steamers between Japan and Northern Korea, the Toyama Bank has commenced business in Northern Korea as the Korean Colony Bank. The Juni Bank has decided to open a specie bank at Vladivostok, and the Chosen Bank is also to open a branch at Vladivostok.

COMMERCIAL FINANCE

Chitose Fire and Marine Insurance Co., Ltd.-Organized with a capital of Y.5,000,000, quarter paid up, to engage in insurance business in Japan and foreign countries. Office, 12 Imono-cho, Nihonbashi-ku, Tokyo. Managing Director, I. Kadono.

New Japan Fire and Marine Insurance Co., Ltd .--Organized in Tokyo with a capital of Y.5,000,000, quarter paid up, to underwrite fire and marine insurance in Japan and foreign countries. Office, 3 Itchome Yuraku-cho, Kojimachi-ku, Tokyo. Managing Director, Y. Kanamitsu.

Plan to Strengthen Fuji Steel Company.—A plan is on foot to reorganize the Fuji Steel Company, operating one of the largest steel plants in Japan. According to the new scheme, Mr. S. Asano, president of the T.K.K., will be the head of the new company and Mr. Hideo Shibusawa will represent the Shibusawa interests. The new organization will be capitalized at Y.5,000,000 and the Yasuda interests will finance the project. Before the present financial and industrial depression, the Fuji Company was one of the most prosperous concerns in Japan. It was, however, after the signing of the armistice compelled to close its doors because of the slump and a disagreement among the members of the board of directors.

The East Asia Industrial Company.—The East Asia Industrial Company (Toa Kogyo Kabushiki Kaisha) was established in 1909 for the purpose of developing economic enterprises in China. In spite of many adverse factors, such as the violent antivery prosperous.

satisfactory, as indicated by the following extracts struction of new vessels and also with a lack of from its report to the shareholders :-

(1) The conclusion of a fifteen million yen loan of the new service.

with the ministry of communications, to be employed in the improvement and construction of the telegraph system in China.

(2) The negotiations for a loan with a certain firm in China which is to be used in establishing a beet

sugar factory.

(3) The electric concern at Hankow to which the Company supplied capital and technical aid, has achieved such a fine success that it has proposed to the Company the redemption of loans previous to the expiration of the term.

(4) Various investments in the several enterprises in Shanghai and other centres of China. The investments made by the Company in China total no

less than seventeen million yen.

The Company is capitalized at twenty million yen of which seven and a quarter million yen has been subscribed to. The management consists of Mr. Kentaro Arai, President; Mr. Shimpei Hiraiwa, Managing Director; Messrs. Jukuro Kadono, Chozo Koike, Masajiro Arase, Eijiro Ono, Teijo Eguchi, and Masaya Suzuki, Directors; and Messrs. Shintaro Ohashi, Kichibei Murai, Matazo Kita, and Kimiye Furuichi, Auditors.

Brunner, Mond Reorganizes.—A private Com pany called Brunner, Mond & Co. (China), Ltd. has recently been registered at Shanghai as a Company under the Hongkong Companies Ordinance of 1911. The Company has been formed for the purpose of taking over as a going concern the assets and good will of the business hitherto carried on in the Republic of China and adjoining territories by Brunner, Mond & Co., Ltd., Northwich, England. The nominal capital of the Company is Shanghai \$2,000,000 divided into 20,000 fully paid up shares of \$100.00 each.

Nantungchow Industrial Loan. - Mr. T. A. Chang and Mr. Chang Chien plan to issue local loan bonds to the amount of two million dollars to provide capital for promoting different industrial enterprises at Nantungchow, such as electricity works, oil mills, soap factories, paper manufactories, automobile roads, a long-distance telephone system. Approval has been given by the selfgovernment association of Nantungchow. The face values of the bonds are \$1,000, \$100, \$10, and \$5, with 8 per cent. of interest. The principal will be repaid from the fourth year after issuance by drawing. Subscriptions open January 1.

SHIPBUILDING

Mitsubishi Launching.—The s.s. Masekka Maru, 3,900 tons, built to the order of the Nanyo Yusen Kaisha, was launched at the Mitsubishi yards, November 27.

New Keel Laid, Uchida Yard, Japan.—The Uchida Dockyard at Yokohama is laying the keel for the construction of the new oil-supply steamer Kurosaki ordered for the Japanese navy.

New Japanese Steamer .- The Takaoka Maru, of 11,000 tons, was launched on November 21 at the Yokohama Dockyard to the order of the Nippon Yusen Kaisha.

T.K.K. Oil Vessel.-The Toyo Kisen Kaisha has reconstructed the Kiyo Maru into a tank vessel for the purpose of carrying petroleum from America. In view of the increasing demand for Japanese agitation, the civil war in China, the sud- petroleum the company has decided to build two den depreciation of silver, and the financial up- tank vessels each of 20,000 tons capacity, and imheavals both in China and Japan, the company is port oil from a certain country other than America. But the company is confronted with the dif-Its business for the past half-year has been very ficulty of obtaining funds required for the condirect or indirect financial aid for the maintenance

A Yangtze River Steamer Launched at Taikoo Docks.-On November 29, the Whangpu, having a gross tonnage of 3,200 tons, was successfully launched at the Taikoo Dockyard in Hongkong. The owners of the new vessel are the China Navigation Co., one of the "W" class of steamers intended for trade between Shanghai and Hankow. The others of this class are the Woosung and Woochang. The particulars of the Whangpu are as follows: Length between perpendiculars, 320 feet; breadth moulded, 46 feet; depth moulded, 14 feet; gross tonnage, 3,204; nett tonnage, 1,975; dead weight, 2,390 tons; draught, 13 feet; speed 12 knots. Her engines are of 1,700 horsepower. She is built of finest quality Sieman's Martin steel, with every modern appliance and convenience for navigation, and is fitted for first class Chinese passengers. Included in her equipment is a gear for lifting 30 tons weight. Special attention has been paid to her officers' quarters, which are large and comfortably furnished, on the upper deck. The captain's quarters consist of a suite of rooms with bath on the lower bridge deck. The machinery consists of two sets of tripleexpansion engines, capable of developing 1,600 indicated horse power, steam being supplied by two large cylindrical boilers working under forced draught on the hot-air, closed-ashpit system, superheated steam being used.

SHIPPING

Chinese Navigation Co .- Mr. Chang Chien recently sent Mr. W. Liu and Mr. S. L. Hsu to Peking to propose founding a navigation company, which can be formally opened in six months if officers are now sent to Europe to order vessels. Mr. Yih Kung-cho, minister of communications, approved this proposal and will extend to the company the new Navigation Regulations. It is reported that officials have been sent to Europe to order vessels by Hon. Chang Chien, and capital: secured for this enterprise.

More Ships for C. M. N. Co.-A resolution to purchase three ocean steamers to ply between Pengpu, Shanghai, Amoy, Swatow, Hongkong and Canton was introduced at a recent meeting of the directors of the China Merchants' Steam Navigation Co. recently at Shanghai. The reason why the China Merchants were unable to compete with foreign shipping companies was due to the lack of sea-going vessels. It was urged that Jardine's had four such vessels, while the China Navigation Company had five. A loan was suggested for the construction of the big steamers if necessary.

Los Angeles-China Line.—Establishment of a \$15,000,000 steamship company, to be known as the Los Angeles-China Line, and to be financed by Los Angeles and Chinese capital, was promised by Fred L. Baker, president of the Los Angeles Pacific Navigation and Los Angeles Steamship companies, at a banquet given by the Chinese Chamber of Commerce to the official of the concerns on September 17.

Oriental Routes.—The following Shipping on Tokyo statistics show the comparative strength of Japanese and other shipping in Oriental waters:

| Routes | | | | July 1914 Tons | Sept. 1920 Tons |
|-----------------|--------|-----|--------|----------------------|-----------------------|
| Japanese | | | | 109,940 | 230,560 |
| European-Foreig | gn | | | 656,153 | 614,809 |
| Japanese | | | | 121,353 | 174,482 |
| North-American | (weste | rn | route) | | |
| Foreign | *** | *** | | 230,568 | 446,597 |
| Japanese | *** | | | _ | 183,620 |

| | | | | July 1914 | Sept. 1920 |
|------------------|---------|---------|-------|--------------|---------------|
| Routes | | | | Tons | Tons |
| North-American | (easte | rn r | oute) | | |
| Foreign | *** | | | | 321,467 |
| Japanese | | (* * *) | | 25,544 | 81,808 |
| South American- | -Foreig | gn | | | |
| т. | | | | 18,109 | 39,898 |
| Australian-Forei | gn | | | 19,829 | 28,417 |
| Japanese | | *** | 4.4.4 | 78,771 | 55,031 |
| Indian-Foreign | *** | SINN | *.* | 138,516 | 129,668 |
| Japanese | *** | * * * | *** | 15,159 | 55,427 |
| South Sea-Forei | gn | | | | 40,301 |
| | | | | | |

Japanese Steamers on the World's Lines.—Returns of the Japanese communications office show that in October, 1920 there were 750 Japanese steel boats of 1,000 tons or over with the aggregate gross tonnage of 2,618,924 tons run on the world's lines, as may be seen from the following details:—

| | | | Steamers. | | | |
|------------------|----------|--------|-----------|--------|----------|---|
| | | | 1 | Number | Gross | |
| Line. | | | | | Tonnage. | |
| Near Sea | | | | 202 | 422,583 | |
| Vladivostok | *** | *** | 4.4.4 | 16 | 127,670 | |
| Korean | | 1904.4 | | 22 | 129,075 | |
| North China | * * * | *** | | 66 | 136,562 | |
| Middle China | (#. %) a | | | 35 | 75,026 | |
| Formosan | | *** | * * * | 17 | 54,535 | |
| South China | | *** | | 19 | 43,559 | |
| Yangtsze | | *** | *** | 12 | 30,345 | |
| Oceanic Island | *** | | | | | |
| Javanese | *** | 4.4.4 | | 22 | 63,279 | |
| Straits Settleme | | | | 20 | 54,988 | |
| Indian | | * + * | 26.60 | 40 | 155,343 | |
| Australian | | *** | *** | 27 | 104,787 | j |
| C .1 A C . | | | | 6 | 120,343 | |
| 77 | | 200 | 200 | 106 | 587,932 | |
| North American | | Coast) | | 35 | 214,439 | |

| | | | | Steam | ers. |
|-----------|--------------|--------|-----|--------|---------|
| | | | | Number | Gross |
| Line. | | | | T | onnage. |
| Central A | merican | *** | | 3 | 17,568 |
| South Am | erican (East | Coast) | | 5 | 82,838 |
| South Ame | erican (West | Coast) | *** | 3 | 24,863 |
| North Am | erica | *** | | 24 | 205,510 |
| Hired by | Foreigners | 0.00 | | 26 | 105,595 |
| In Docks | *** | *** | | 27 | 71,443 |
| Stranded | *** | *** | *** | 3 | 5,037 |
| | | | | | |

Japanese Cargo-Boats.—An investigation made by the Shipping Department of Messrs. Mitsui & Co. gives the total number of Japanese cargo-boats run on the world's lines on November 9 as 473 in number and 2,289,101 tons in tonnage, details of which may be seen from the following table:—

| | | | | Steamers. | | |
|------------------------------|---------|---------|---------|-----------|-----------|--|
| | | | | Number | Gross | |
| Line. | | | | | Tonnage. | |
| European | | | | 74 | 523,050 | |
| Mediterranean | | | | 13 | 84,425 | |
| South American | n | | | 5 | 40,572 | |
| South African | | | | 6 | 43,270 | |
| Japanese-North | Amer | ican-P | acific | 8 | 65,568 | |
| North America | n-Atlar | itic | *** | 20 | 147,190 | |
| Australian | | | | 30 | 157,205 | |
| Javanese | | | | 20 | 97,621 | |
| South Sea-India | in-Sout | h Ch | inese | | | |
| Sea | *** | | | 72 | 430,164 | |
| Coasting | *** | | | 186 | 482,960 | |
| Chartered | * | *** | | 6 | 20,973 | |
| Owned by the Government Iron | | | | | | |
| Works | *** | | | 2 | 9,830 | |
| In Docks | (F.S). | *** | *** | 14 | 58,838 | |
| Chartered by t | | | | 7 | 26,763 | |
| Missing | *** | | V. 4. 4 | 1 | 5,750 | |
| Tied Up | | */** | * * * * | 6 | 24,822 | |
| Stranded | | * * * | | 3 | 70,100 | |
| Total | * * * | * * * * | | 473 | 2,289,101 | |
| | | | | | | |

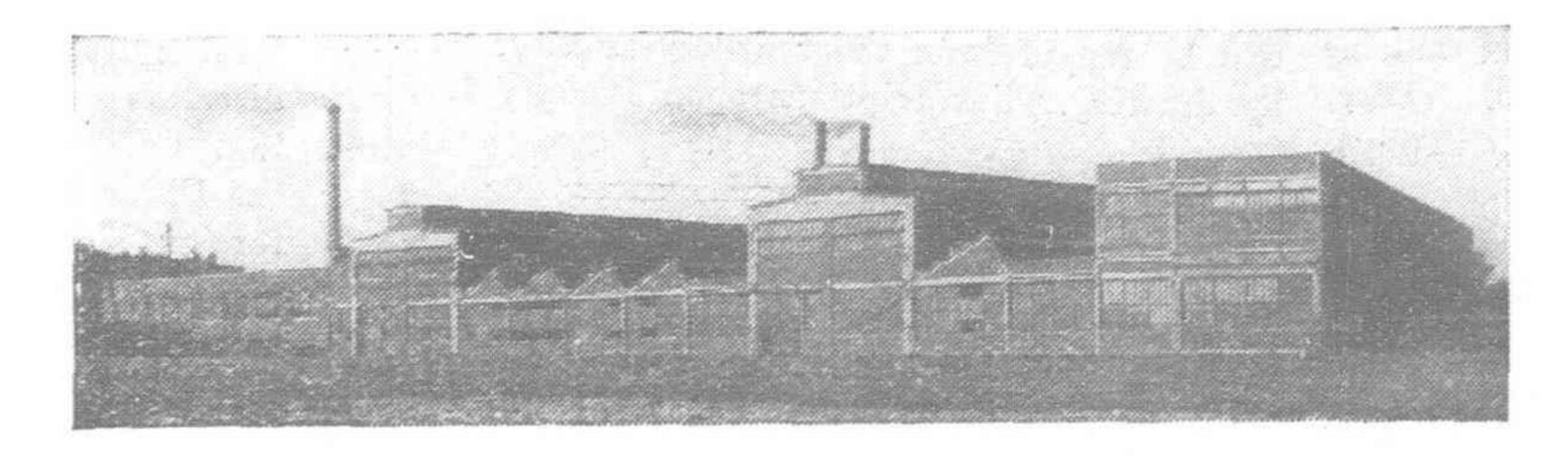
N.Y.K. Business for Last Term.—The business receipts of the Nippon Yusen Kaisha for the last half-year term ending September 30 resulted in a decrease of about 46 per cent., or Y.7,100,000, the total amount of the gains for the term being Y.9,380,000 against Y.16,990,000 of the previous term.

Below are the accounts for last term and for the preceding term:

| Last Term (Apr. Sept. /20) (Figures in | |
|--|--------|
| Gross receipts71,385 | 82,162 |
| Gross disbursement59,064 | 62,744 |
| Profit12,320 | 19,418 |
| Vessels depreciation fund 1,540 | 1,275 |
| Vessels insurance 972 | 784 |
| Vessels repair fund 363 | 309 |
| Building depreciation fund 55 | . 52 |
| Net gain for the term 9,388 | 16,996 |
| Brought over from pre- | |
| vious account 3,044 | 3,061 |
| Total12,433 | 20,058 |
| To legal reserve 470 | 850 |

Sino-Belgian Navigation Company.—Mr. Chang Chien, former minister of the Tuan cabinet, with the co-operation of his friends and others, have signed an agreement with some Belgian capitalists from Antwerp for the formation of a Chinese-Belgian steamship company to run steamers between Shanghai, Antwerp, Rotterdam, Hamburg. Mr. Liu Chen is proceeding to Peking to place this proposal before the government for approval and support and it is hoped that the Sino-Belgian steamship navigation company will be organized next spring with a fleet of four ocean-going steamers which are in course of construction in Europe.—Chinese report.

THE WELL EQUIPPED SHOP DOES GOOD WORK.



General View of the Betts Machine Company's Plant.

For the creation of good accurate work, the surroundings and conditions under which men labor must be conducive to happiness and health.

The works of the Betts Machine Company, started by A. & E. Betts in 1861, is erected in a large open space giving the most daylight for the machine operations, and away from the congestion of the metropolis.

This works includes machine shop, pattern shop and the foundry building. The works covers about 190,000 square feet, and is of the most modern construction with all conveniences tending towards high production and accuracy of products. It is on the main lines of the New York Central Railroad between Buffalo and New York. The General Sales and Main Office of the Company is located at the works. Visitors from abroad are always welcome and will be shown through the plant.

A Betts Machine Tool for every need in heavy duty work. Let us have your problems.

BETTS MACHINE COMPANY

Cable Address
"Betts"

BLOSSOM ROAD, ROCHESTER NEW YORK, U. S. A. Established in 1861